

11
Journal
AMERICAN
VETERINARY REVIEW

EDITED BY

PROF. A. LIAUTARD, M.D., V.M.

Member Central Society of Veterinary Medicine (Paris). Honorary Fellow Royal College Veterinary Surgeons (England). Foreign Corresponding Member Academy of Medicine Bruxelles (Belgique),

AND

Prof. ROBERT W. ELLIS, D.V.S.

WITH THE COLLABORATION OF

- | | |
|--|---|
| Prof. W. J. COATES, M.D., D.V.S., New York-American Veterinary College. | J. F. DE VINE, D.V.S., Dept. Agr., Goshen, N. Y. |
| OLAF SCHWARZKOPF, Veterinarian, 3d Cavalry, Instructor Mounted Service School, Ft. Riley, Kan. | D. ARTHUR HUGHES, Ph.D., D.V.M., Insp. Comm. Dept., U. S. Army, Chicago, Ill. |
| Prof. W. REID BLAIR, D.V.S., New York-American Veterinary College. | JOHN R. MOHLER, V.M.D., Chief of Pathological Division B.A.I., Washington, D.C. |
| Prof. S. STEWART, Kansas City Veterinary College, Kansas City, Mo. | Prof. L. A. MERILLAT, V.S., Chair of Surgery McKillip Veterinary College, Chicago, Ill. |
| Prof. M. H. MCKILLIP, M.D., V.S., McKillip Veterinary College, Chicago, Ill. | D. E. SALMON, D.V.M., Ex-Director of the Veterinary School, Montevideo, Uruguay. |
| B. F. KAUPP, M.S., D.V.S., Commissioner of Public Health, Spartanburg, S. C. | Prof. VERANUS A. MOORE, Director, New York State Veterinary College, Ithaca, N. Y. |
| Prof. M. H. REYNOLDS, University of Minnesota, St. Anthony Park, Minn. | RICHARD P. LYMAN, Dean Vet. Div. Mich. Agr. College, East Lansing, Mich. |
| WM. H. DALRYMPLE, M.R.C.V.S., Veterinarian Louisiana Ag. Exp. Sta., Baton Rouge, La. | C. J. MARSHALL, V.M.D., President A. V. M. A., Philadelphia, Pa. |
| JOHN P. O'LEARY, V.M.D., Veterinary Inspector in Charge, B. A. I., Troy, N. Y. | A. D. MELVIN, M.D.C., Chief of B.A.I., Washington, D. C. |
| A. T. KINSLEY, M.Sc., D.V.S., Path. Kansas City Veterinary College, Kansas City, Mo. | GEO. H. GLOVER, M.S., D.V.M., Director Div. Vet. Sci., Colo. Agr. Coll., Ft. Collins, Colo. |
| Prof. S. SISSON, S.B., V.S., Prof. Comp. Anat., Ohio State University, author of Sisson's Vet. Anat., etc., Columbus, O. | S. A. GRUENER, M.V.S., Veterinary Inspector, Kamtchatka, Russia. |
| J. G. RUTHERFORD, V.S., H.A.R.C.V.S., Ex-Veterinary Director-General and Live Stock Commissioner, Ottawa, Canada. | NELSON S. MAYO, M.S., D.V.S., Secretary A.V. M. A., 4753 Ravenswood Avenue, Chicago, Ill. |

And several others.

VOLUME XLIV.

NEW YORK :

PUBLISHED BY AMERICAN VETERINARY REVIEW,
509 WEST 152d STREET.

597760
7. 12. 54

SF

601

A5

v. 44

cop. 2

LIST OF ILLUSTRATIONS IN VOLUME XLIV.

	PAGE
Cerebro-Spinal Meningitis of the Horse, a typical field case.....	80
Two interesting cow cases.....	87-88
Gastrothoracopagus	247
Controlling Chicken-pox, Sore Head or Contagious Epithelioma by Vaccination	331
Ablation of Right Mammæ.....	378
James Lindsay Robertson.....	Frontispiece to No. 4
The Diagnosis of Glanders—	
I. Strong purulent discharge with swelling and gluing together of both lids	440
II. Strong purulent discharge with swelling of both lids.....	441
Outbreak of Tuberculosis in Pigeons.....	499
Glanders	505
Generalveterinär Dr. Franz Hell.....	518
Studies on the Virus of Hog Cholera—	
Fig. 1. Microphotograph of spirochete in blood of Hog 504.....	559
Fig. 2. Microphotograph, spirochete stained by Giemsa method, from intestinal ulcer of Hog 556..	562
Fig. 3. Microphotograph of spirochetes in impure culture, from cecal ulcer of Hog 551.....	562
Charts showing strains of virus.....	564-572, 684-697
General A. Barrier, Veterinary Inspector of the French Army.....	665
Heart Anomaly—	
Photographs I. and III.....	746
Photograph II.	747
Bovine foetus affected with Hydrocephalus.....	750
Schistocormus Reflexus	753
Route of official tour of Europe by American Veterinarians.....	787

INDEX TO AUTHORS.

	PAGE		PAGE
Ackerman, E. B.....	218	Jervis, H. B. F.....	600
Alcalay, S. J.....	503	Jones, F. S.....	497
Archibald, R. A.....	58	Kaupp, B. F.....	75
Baeslack, F. W.....	555, 684	Keane, Charles	218
Beach, B. A.....	330	Kenny, Thomas B.....	448
Beere, Charles H.....	611	King, Walter E.....	555, 684
Blakely, Chester M.....	374	Kinsley, A. T.....	227
Bosshardt, John K.....	595	Klein, Louis A.....	232
Boyd, Mark F.....	263	Lawson, Walter	754, 755
Brown, F. F.....	237	Liautard, A.	30, 94, 249, 252, 379, 381
Burnett, J. A.....	259	415, 506, 509, 613, 616, 621, 756, 758, 760	
Bushnell, L. D.....	194	Love, Grover V.....	504
Butterworth, T.....	386	McGilvray, C. D.....	218
Cesari, E.....	760	McKillip, George B.....	208
Clark, R. R.....	700	McLaughlin, John A.....	310
Clark, W. L.....	612	McLean, L.....	515
Cochran, David W.....	491	Maurer, Otto	194
Colton, Chas. L.....	732	Mayo, N. S.....	387
Cook, W. B.....	80	Merillat, L. A.....	19, 166
Cotton, Charles E.....	218	Mohler, John R.....	31, 437
Cotton, W. E.....	307	Moore, Veranus A.....	458
Day, L. Enos.....	66	Morris, Charles E.....	723
Desmond, J.	748, 793	Nutter, John W.....	242
De Turk, M. D.....	604	O'Leary, John P.....	255
De Vine, J. F.....	350, 588, 728	Palmer, Herbert F.....	367
Eichhorn, Adolph . . .	31, 218, 260, 437	Pendergast, Wm. M.....	609
English, Andrew	745	Pierce, M. A.....	581
Fish, Pierre A.....	340	Ratigan, W. J.....	766
Foster, Robert J.....	633	Reichel, John	218
Frey, Chas. T.....	247	Rogers, T. B.....	607, 709
Frost, W. D.....	476	Salley, I. L.....	245
Gill, H. D.....	72	Schroeder, E. C.....	467
Gilyard, A. T.....	736	Schwarzkopf, Olaf	519, 634, 771
Greenwood, R. A.....	378	Sellers, A. W.....	262
Hadley, F. B.....	330	Slack, F. H.....	716
Hamilton, H. M.....	376	Slawson, A.	501
Harries, T. B.....	610	Smith, Jos. J.....	504
Hart, Chas. H.....	753	Steele, Garrison	760
Healy, Daniel J.....	242	Stoute, R. A.....	625
Henry, Max	513	Todd, A. S.....	752
Hilton, George	573	Weaver, Philip V.....	377
Hobday, Frederick	47	Weston, E. A.....	87
Hoffmann, George L.....	555, 684	Whitehouse, A. W.....	624
Hollingworth, Walter G.....	484	Woodward, B. T.....	359
Hughes, D. Arthur.....	265	Yard, Wm. W.....	372
Hutyra, Francis	261		

TABLE OF CONTENTS, VOLUME XLIV.

	PAGE		PAGE
Abdominal Eventration.....	620	Aneurism in a Himalayan Bear	508
Abdominal Lesion	757	Animals, Domestic, Nervous Diseases in	531
Abdominal Surgery	7	Anomaly, Genital, in a Dog.....	622
Abdominal Surgery, Scope of in Animals	47	Anomaly, Heart, Case Report...	745
Ablation of Right Mammae, Case Report	377	An Open Joint.....	251
Abortion Bacillus, Pure Milk Production and the.....	497	Ante-Diaphragmatic Oesophageal Jabot Resembling Pulmonary Emphysema in Horse.....	621
Abortion, Epizootic in Bovines.	291	Antemortem Diagnosis of a Gut Tie, Case Report.....	378
Abortion, Infectious, Persistence of the Bacillus of in the Tissues of Animals.....	307	Anthrax in a Horse.....	508
Abscess in Left Cerebral Hemisphere	254	Anthrax Outbreak, Vaccination Double Method, Case Report.	504
Absolute Reliability of Double Anthrax Vaccine in Controlling Well-established Outbreaks of Anthrax	372	Apoplexy, Parturient, with Relapse	253
Abstracts from Exchanges...90, 249, 379, 506, 613, 756		Apparent Inconsistencies of Biologic Diagnostics.....	58
Accident, Terrible, to a Race Horse	756	Appendix and Appendicitis in a Small Mule	512
Actinomycosis in a Cat.....	94	Army Veterinary Department..	265.
Acute Indigestion in a Cow—Rumenotomy, Case Report.....	753	517, 633, 709	
Acute Poliomyelitis in a Mare...	616	Army Veterinary Service Bill, the Profession Rejoices at the Passage, Unanimously, of the, by the House Military Committee	675
Address by Prof. William A. Evans, Chicago, Ill.....	178	Arrested Development of a Tooth Fang in a Bitch Due to Injury; Case Report.....	609
Adrenaline in Veterinary Medicine	156	Arthritis Pyaemic, Case Report	376
A Few Words on the Pathologic Scenery	608	Arthritis, Treatment—Its Treatment	154
A Golden Legacy, to the Purposes and Possibilities of Which We Have Not Been Insensible	12	Articular Wounds—Their Treatment	253
Alumni Association to Be Recognized	18	Artificial Insemination and Its Relation to the Veterinarian.	237
American Veterinary Medical Association, Official Tour of Europe of the.....	553	Auto-Serotherapy in Veterinary Ophthalmology	617
Amputation of the Limb in a Cow	507	Azoturia, Case in Rain, Case Report	504
Anal Imperforation, Absence of Rectum and of Last Loop of the Colon, Renal Lymphitis in a Pig	622		
Analysis of Dr. McLaughlin's Paper on "the Tissue Medium."	448	B. A. I. Employees, Lobeck, Classification Bill for.....	653
		Bang's Bacillus, On.....	701
		Barium Nitrate, Poisoning by..	507
		Barrier, General A., Veterinary Inspector	663

PAGE	PAGE
B. Bulgaricus, the Use of Milk Cultures in the Prevention and Treatment of Bacillary White Diarrhea of Young Chicks 194	Cerebral Paralysis 91
Bear, Himalayan, Aneurism in a 508	Cerebral Tuberculosis, Peculiar Case of in a Steer..... 511
BIBLIOGRAPHY—	Cerebro-Spinal Meningitis of the Horse; Case Report..... 75
A Compend on Bacteriology. 203	Chloroform Standing 380
Clinical Bacteriology and Vac- cine Therapy 630	Chronic Nasal Discharge..... 379
Imperial Bacteriological Labor- atory, Muktesar, India... 626	Cirrhosis of the Liver, Hyper- trophic, in a Horse..... 254
Manual of the Practice of Vet- erinary Medicine 767	Clove Oil in Open Joint..... 252
Pocket Cyclopedia of Medi- cine and Surgery 263	Cocaine Law and Veterinarians. 306
Text Book of Horseshoeing.. 631	Cocaine Prescriptions, Ruling as to 410
Bill, House, 9292..... 678	Cocaine, Unusual Susceptibility to 93
Bill, the Lobeck..... 553	Coccidiosis, Bovine 600
Biologic Diagnostics, Apparent Inconsistencies of..... 58	Coecum, Intussusception of the in a Horse 613
Bite, Snake (?)..... 614	Colleges, Veterinary, Complying with Requirements of A. V. M. A. 46
Bony Tuberculosis of Fowls... 252	College, Uruguay Veterinary... 411
Bovine Coccidiosis 600	Colics, Surgical Treatment of in Animals 19, 166
Bovine Foetus Affected with Hy- drocephalus, Case Report..... 748	Coloring Microbes 160
Breeding, Horse, in New Jersey. 581	Concerning the Action of Pe- troleum 255
Breeding of the Proper Type of Horses Should Be Encouraged. 728	Congenital Intestinal Defect in a Foal 249
Bullock, Intussusception in a.... 506	Constipation, an Unusual Case of in an Aged Horse; Case Report 374
Calcitrans, Stomoxys 297	Controlling Chicken-pox, Sore Head or Contagious Epi- thelioma by Vaccination.... 330
Calf, Pulmonary Collapsus with Calcification in a..... 509	Control of Glands in New York State 588
Calf Scourage and Serotherapy.. 256	Control of Hog Cholera by Slaughter Methods 573
Cancer in Horses..... 299	Correspondence .250, 386, 513, 621, 763
Canine Hemopoietic Serum with Hemorrhagic Enteritis in Lioness 649	Cow, Amputation of the Limb in a 507
Canine Iso-Serotherapy 9	Cow, Dystokia in—Paraplegia— Case Report 611
Canker of the Foot and Arsen- ious Acid 615	Cow, Rigid Os Uteri in a, Case Report 503
Cannabis 367	Cow, Two Interesting Cases, Case Report 87
Carrel's New Experiments..... 4	Cows, Nymphomany in..... 758
Case, Ovaro-Hysterectomy in an Uncommon 250	Cranium, Fracture of the, in a Horse 381
Cases, Reports of..... 75, 247, 374, 497, 609, 736	Cuneiform, Fracture of the... 381
Cases, Some Interesting..... 613	Curious Accident 756
Castration, Unusual Sequela to. 92	Cytitis, Pyelonephritis and, by Gastric Foreign Body in a Cow 610
Cat, Actinomyces in a..... 94	Cyst, Uterine, in a Cow..... 618
Catarrh, Purulent, of the Frontal and Maxillary Sinuses in a Horse 258	
Cat, Dermatomyoma in a..... 255	
Cecum in the Horse, Impaction of the, Case Report..... 736	

	PAGE
Death of a Friend of Ours.....	517
Dermatitis Erysipelatosa, Skin Lesion of the Horse Resem- bling	756
Dermatomyoma in a Cat.....	255
Diagnosis of Glanders.....	437
Diatribes on Major General Leon- ard Wood—"Now for a Vet- erinary"	769
Direct Medicine, Case Report... 8)	
Disease, John's	723
Disease of Middle Ear—Lingua- tula Teniodes in Nasal Cham- ber of an Otter Hound.....	251
Diverticulum of Floating Colon Causes Fatal Obstruction in a Horse	511
Diverticulum of the Rectum of Pseudo-Perineal Hernia; Case Report	611
Dr. Carrel's New Experiments.	4
Dog Distemper, Hyposulphite of Soda in	510
Dog, Hodgkin's Disease in a....	381
Dog, Lympho-Sarcoma in the, Case Report	501
Doping, The	151
Double Anthrax Vaccine, the Absolute Reliability of in Con- trolling Well-Established Out- breaks of Anthrax.....	372
Dystokia in Cow—Paraplegia, Case Report	611
EDITORIAL—	
A Golden Legacy—To the Purposes and Possibilities of which We Have Not Been Insensible	12
Cocaine Law and Veterina- rians	306
House Bill 9292.....	678
James L. Robinson, V. S., M.D., D.V.S.	415
Lobeck Bill	552
Mark You This—The <i>Army and Navy Journal</i> Says the Army Veterinary Service Bill Will Likely Pass.....	549
New Orleans in 1914.....	164
Now Is the Time.....	433
Official Tour of Europe of the American Veterinary Medi- cal Association	553

	PAGE
EDITORIAL—	
Profession Rejoices at the Passage, Unanimously, of the Army Veterinary Serv- ice Bill by the House Mil- itary Committee	675
Richard Glover, F. R. C. V. S.	430
Team Work for Veterinary Legislation	162
Tenth International Veterinary Congress, London	681
Tribute to the Memory of James L. Robertson from a Former Student	434
Veterinary Congress in Ithaca.	541
Veterinarians and Horse Breeding	679
Veterinarians and the Allied Horse Interests	304
What Are We Going to Do in the United States Senate?.	301
William Hunting, F.R.C.V.S.	430
Elbow, Capped, Treatment of..	429
Electrargol in Tetanus	619
Elimination of Sources of Con- tamination in Milk.....	476
Empirical Therapeutics	93
English Review	90, 249 379, 506, 613, 756
Epizootic Abortion in Bovines..	291
EUROPEAN CHRONICLES—	
Abdominal Surgery	7
Adrenaline in Veterinary Medicine	156
A Few Words on the Patho- logic Scenery	668
Bibliography ..10, 161, 297, 432,	539
Cancer in Horses.....	299
Canine Iso-Serotherapy	9
Coloring Microbes	160
Dr. Carrel's New Experiments	4
Epizootic Abortion in Bovines.	291
Foot and Mouth Disease in Man	158
Geel-Dikkop	430
General A. Barrier, Veterinary Inspector	663
Generalized Mycosis in Cattle.	419
Human and Veterinary Sur- gery	293
Inborn or Specific Aptitude with Tuberculosis Microbe.	534
Morphia and Opium in Horses	536
Nervous Diseases in Domestic Animals	531
On Chronic Roaring	673

	PAGE		PAGE
EUROPEAN CHRONICLES—		Geel-Dikkop	430
Prethoracic and Malignant		General A. Barrier, Veterinary	
Tumors	I	Inspector	663
Rabies in Solipeds.....	296	General Education in Regard to	
Sarcosporidiosis	666	Glanders and Public Drinking	
Stomoxys Calcitrans	297	Fountains	359
Surgery of Foreign Bodies in		Generalized Mycosis in Cattle..	419
Oesophagus	423	Genital Anomaly in a Dog.....	622
Tenth International Veterinary		German Review	355
Congress	538	Glanders	595
The Doping	151	Glanders, a Resume on the Con-	
Treatment of Capped Elbow..	429	trol and Eradication of.....	72
Traumatic Arthritis — Its		Glanders, Control of in New	
Treatment	154	York State	588
Virus of Rabies.....	425	Glanders, Diagnosis of.....	437
Yohimbine in Veterinary Medi-		Glanders in Man.....	508
cine	427	Glanders, Report of the Special	
Eventration, Abdominal	620	Committee for the Detection	
Exchanges, Abstracts from.....	90, 249,	of	218
	379, 500, 613, 756	Glanders Vaccine, Immunization	
Exostosis of the Vertebral Col-		Tests with	31
umn Causes Hemorrhage of		Glover, Richard, F. R. C. V. S..	436
the Vena Cava.....	94	Goitre and Roaring in Horse....	621
Extensive Rupture of the		Grossich's Method in Veterinary	
Stomach	615	Surgery	760
External Remedies in Medicine—		Gut-Tie, Antemortem Diagnosis	
Glycerine Applications	257	of a, Case Report.....	378
Extraordinary Injury	92		
Filariasis of Horses.....	758	Hairs, Shedding of the Protec-	
Firing	208	tion	258
Floating Colon, Diverticulum of		Heart Anomaly, Case Report...	745
Causes Fatal Obstruction in a		Heifer, Parasitic Cyst in the	
Horse	511	Brain of a.....	566
Foal, Congenital Intestinal De-		Hemisphere, Abscess in Left	
fect in a.....	249	Cerebral	254
Foal, Mule Mare with.....	251	Hemorrhagic Enteritis with	
Foal, Pyelo-Nephritis in a.....	92	Canine Hemopoietic Serum in	
Foot and Mouth Disease in Man	158	Lioness	619
Foot, Canker of the, and Ar-		Hemorrhagic Septicaemia in Cat-	
senious Acid	615	tle, Some Observations and Ex-	
Fracture of the Cranium in a		periences with	700
Horse	381	Hernia, Scrotal, in a Foal.....	90
Fracture of the Cuneiform....	381	Heterochronous Milk Secretion.	96
Fracture of the Navicular Bone		Hip Joint, Lameness of the....	491
in a Horse, Rare Case of Re-		Hodgkin's Disease in a Dog....	381
covery from	762	Hog Cholera, Control of by	
Fracture of the Second Dorsal		Slaughter Method	573
Vertebrae in a Horse.....	383	Hog Cholera, Sanitary Police	
Fracture of the Sternum and		Measures and	227
Ribs	383	Hog Cholera Serum in Practice.	732
French Review	94, 252, 381	Hog Cholera, Studies on the	
	509, 616, 758	Virus of	555, 684
Friend of Ours, Death of a....	517	Horse, Anthrax in a.....	508
Gastric Tympany	250	Horse Breeding in New Jersey.	581
Gastric Tympany in a Horse,		Horse Breeding, Veterinarians	
Case Report	610	and	679

	PAGE		PAGE
Horse Doctor and the Man Doctor.....	771	Knot in Intestine in Mare, Case Report	376
Horse Interests, Veterinarians and the Allied.....	304	Lameness of the Hip Joint.....	491
Horse, Sarcoma of the Stomach in a	91	Laryngo-Pharyngo-Oesophageal Spasms in Horses.....	616
Horse, Cancer in.....	299	Larynx, Spasms of the.....	379
Horses, Breeding of the Proper Type of, Should Be Encouraged	728	Legacy, a Golden—to the Purposes and Possibilities of Which We Have Not Been Insensible	12
Horses, Filariosis of.....	758	Legislation, Veterinary, of the Future or the Duties of the Veterinarian of the Future... ..	484
Horses, Morphia and Opium in.....	536	Lesion, Abdominal	757
Horses Won	556	Linguatula Teniodes in Nasal Chamber of an Otter Hound—Disease of the Middle Ear... ..	251
House Bill 9292.....	678	Liver, Polycystic Affection of the, in a Bovine.....	512
Human and Veterinary Surgery.....	293	Lobeck Bill, The.....	552
Hunting, William, F. R. C. V. S.	436	Lobeck Classification Bill for B. A. I. Employees.....	653
Hydrocephalus, Bovine Foetus Affected with, Case Report....	748	Lymphadenitis and Multiple Cutaneous Tumors in a Horse.	90
Hypertrophic Cirrhosis of the Liver in a Horse.....	254	Lympho-Sarcoma in the Dog, Case Report	501
Hyposulphite of Soda in Dog Distemper	510		
If There Were to Be War with Mexico, Where Would We Get the Horses?.....	265	Mammæ, Right, Ablation of, Case Report	377
Ileum, Operation for Intussusception of, in a Cow.....	595	Man, Foot and Mouth Disease in.....	158
Immigration Tests with Glanders Vaccine	31	Man, Glanders in.....	508
Impaction of the Cecum in the Horse, Case Report.....	736	Mark You This—The Army and Navy Journal Says the Army Veterinary Service Bill Will Likely Pass.....	549
Improved Method of Mounting Museum Specimens	66	Meat Inspection, United States Government	458
Inborn or Specific Aptitude with Tuberculosis Microbe	534	Medicine and Surgery, Pocket Cyclopedia of	263
Infectious Phlebitis of the Right Hind Leg, Septicemia Following	759	Medicine Direct, Case Report... ..	89
Injury, an Extraordinary.....	92	Medium, the Tissue.....	319
Intestinal Obstructions in Ruminants	95	Melanotic Sarcoma with Cutaneous and Polyvisceral Metastasis in a Dog.....	255
Intestine, Knot in, in Mare, Case Report	376	Meningitis, Cerebro-Spinal, of the Horse, Case Report.....	75
Intussusception in a Bullock....	506	Meningo-Encephalitis in a Dog, Sub-Acute Diffused.....	511
Intussusception of the Cecum in a Horse.....	613	Mexico, If There Were to Be War With, Where Would We Get the Horses?.....	265
Invagination of the Small Intestine in a Dog; Case Report.	610	Microbes, Coloring	160
Iso-Serotherapy, Canine	9	Milk, Elimination of Sources of Contamination in	476
Italian Review	760	Milk Fever, Prevention of.....	380
Ithaca, Veterinary Conference at.	541	Milk Secretion, Heterochronous.	96
James L. Robertson, V.S., M.D., D.V.S.	415		
John's Disease	723		
Joint, an Open.....	251		

	PAGE		PAGE
Morphia and Opium in Horses..	536	Ovaro-Hysterectomy in an Un-	
Mule, Appendix and Appen-		common Case	250
dicitis in a Small.....	512	Oxygen Subcutaneously	259
Mule Mare with Foal.....	251		
Museum Specimens, an Improved		Paralysis, Cerebral	91
Method of Mounting.....	66	Paralysis of the Interior Pop-	
Mycosis, Generalized, in Cattle..	419	liteal Nerve in Cattle.....	506
		Parasitic Cyst in the Brain of a	
Nasal Discharge, Chronic.....	379	Heifer	506
Nervous Diseases in Domestic		Parenchymatous Mastitis, Thera-	
Animals	531	peutics of	232
New Orleans in 1914.....	164	Pareto-Ataxia Troubles in a	
News and Items. 147, 286, 410, 653,	788	Dog, Sclerosis with.....	382
New Treatment of Sarcopic		Parturient Apoplexy with Re-	
Mange in Horses.....	750	lapse	253
New Veterinary Association Or-		Parturition Case	91
ganized in Minnesota.....	457	Pathologic Scenery, a Few	
"Now for a Veterinary"—A Di-		Words on the.....	668
atribe on Major General Leon-		Peculiar Case of Cerebral Tuber-	
ard Wood	769	culosis in a Steer.....	511
Now Is the Time.....	433	Peculiar Case of Obstetrics in	
Nymphomany in Cows.....	758	Cow, Case Report.....	612
		Persistence of the Bacillus of In-	
OBITUARY—		fectious Abortion in the Tis-	
Andrew M. Jansen, D.V.M....	773	suess of Animals.....	307
Charles H. McGillicuddy, V.S.	733	Petroleum, Concerning the	
Dr. Elmer Craft.....	389	Action of	255
Frederick H. Osgood,		Pharyngitis	510
M.R.C.V.S.	791	Physiologic Principles in Thera-	
George H. Peters, M.D.V....	389	peutics	340
James Lindsay Robertson,		Placenta Found in Rumen of	
M.D., V.S., D.V.S.....	390	Cow, Case Report.....	755
John Brooks	792	Pleuresy, Treatment of, by In-	
Martin Gehres, D.V.M.....	733	jections of Air.....	384
Mrs. George W. Dunphy....	791	Pleuritic Effusions, the Treat-	
Obstetrics, Peculiar Case of in		ment of	249
Cow, Case Report.....	612	Pneumonia, Contagious, of	
Oesophageal, Ante-Diaphragmatic		Horses, Recent Investigations	
Jabot Resembling Pulmonary		of, and the Salvarsan Treat-	
Emphysema in Horse.....	621	ment of the Disease.....	634
Oesophagus, Surgery of Foreign		Pneumonia, 606 in Infectious...	382
Bodies in	423	Poisoning by Barium Nitrate..	507
Official Tour of Europe of the		Poliomyelitis, Acute, in a Mare.	616
American Veterinary Medical		Poll Evil, Treatment of Without	
Association	553	Operation	615
Oil, Clove, in Open Joint.....	252	Polycystic Affection of the Liver	
Operation for Intussusception of		in a Bovine.....	512
Ileum in Cow.....	595	Popliteal Nerve, Interior, in Cat-	
Ophthalmology, Veterinary, Auto-		tle, Paralysis of the.....	506
Serotherapy in	617	Prescribing and Prescription	
Orchitis, Tuberculous in a Horse	384	Writing	245
On Bang's Bacillus.....	761	Prethoracic and Malignant	
On Chronic Roaring.....	673	Tumors	1
Outbreak of Tuberculosis in		Prevention of Milk Fever.....	380
Pigeons, Case Report.....	497	Prof. William A. Evans, Chi-	
Osteomas of the Shoulder.....	760	cago, Ill., Address by.....	178

PAGE	PAGE
Proposed Elimination from the United States Pharmacopoeia. 607	Reports of Cases.....75, 247, 374 497, 609, 736
Prostatitis, Renal Sarcoma and, in a Dog..... 250	Resume on the Control and Eradication of Glanders..... 72
Profession Rejoices at the Passage Unanimously of the Army Veterinary Service Bill by the House Military Committee.... 675	Review, English .....90, 240, 379 506, 613, 756
Public Drinking Fountains, Glanders and, General Education in Regard to..... 359	Review, French .....94, 252, 381 509, 616, 758
Publishers' Department ....150, 290, 414, 530, 662, 796	Review, German 255
Pulmonary Collapsus with Calcification in a Calf..... 509	Review, Italian 760
Pure Milk Production and the Abortion Bacillus 467	Review, Roumanian 621
Pus and Streptococci in Milk, Significance of 716	Richard Glover, F.R.C.V.S. 436
Purulent Catarrh of the Frontal and Maxillary Sinuses in a Horse 258	Rigid Os Uteri in a Cow, Case Report 503
Pyæmic Arthritis, Case Report. 376	Roaring, Goitre and in Horse.. 621
Pyelonephritis and Cystitis by Gastric Foreign Body in a Cow 619	Roaring, On Chronic..... 673
Pyelo-Nephritis in a Foal..... 92	Robertson, James L., a Tribute to the Memory of, from a Former Student 434
Rabies in Solipeds..... 206	Robertson, James L., V.S., M.D., D.V.S. 415
Rabies, Virus of..... 425	Roumanian Review 621
Rain, Azoturia Case in, Case Report 504	Ruling as to Cocaine Prescriptions 410
Rare Case of Recovery from Fracture of the Navicular Bone in a Horse..... 762	Rumea of Cow, Placenta Found in, Case Report..... 755
Rare Tuberculous Lesions in Bovines 96	Rumenotomy—Acute Indigestion in a Cow, Case Report..... 753
Recent Investigations of Contagious Pneumonia of Horses, and the Salvarsan Treatment of the Disease..... 634	Rumen, Tympany of the, or Bloating: With a Prompt and Efficient Remedy 242
Rectum, Diverticulum of the, of Pseudo-Perineal Hernia, Case Report 611	Ruminants, Intestinal Obstructions in 95
Remedies, External, in Medicine—Glycerine Applications 257	Rupture of the Stomach in Horse Caused by Blocking the Outlet of Ingesta in Determining Ingestion, Case Report 612
Renal Lymphitis in a Pig—Anal Imperforation—Absence of Rectum and of the Last Loop of the Colon..... 622	Rupture of the Uterus in a Cow. 757
Renal Sarcoma and Prostatitis in a Dog..... 250	Sanitary Police Measures and Hog Cholera 227
Report of Surgeon-General, U. S. Army, 1913..... 633	Sarcoma, Melanotis, with Cutaneous and Polyvisceral Metastasis in a Dog..... 255
Report of the Special Committee for the Detection of Glanders. 218	Sarcoma of the Stomach in a Horse 91
	Sarcoptic Mange in Horses, New Treatment of 759
	Sarcosporidiosis 666
	Schistocormus Reflexus, Case Report 752
	Science, Veterinary, from a Country Practitioners' Viewpoint 350
	Sclerosis with Pareto-Ataxia Troubles in a Dog..... 382

	PAGE
Scope of Abdominal Surgery in Animals	47
Scrotal Hernia in a Foal.....	90
Septicemia Following Infectious Phlebitis of the Right Hind Leg	759
Serotherapy, Calf Scourage....	256
Serum in Practice, Hog Cholera.	732
Shedding of the Protection Hairs	258
Shoulder, Osteomas of the.....	760
Significance of Pus and Streptococci in Milk.....	716
606 in Infectious Pneumonia....	382
Skin Lesions of the Horse Resembling Dermatitis Erysipelatosa	756
Small Intestine, Invagination of the in a Dog, Case Report....	610
Snake Bite (?).....	614

SOCIETY MEETINGS—

Address by Dr. A. Joly, Live-stock Sanitary Commissioner	650
Alumni Association of the New York American Veterinary College	403
American Veterinary Medical Association	97, 270
Association of State and Provincial Veterinary Colleges.	391
Central New York Veterinary Medical Association	527
Connecticut Veterinary Medical Association	409
Georgia State Veterinary Association, President Wm. M. Burson's Address Before...	524
Keystone Veterinary Medical Association	285, 408, 786
Maine Veterinary Medical Association	283, 781
Massachusetts Veterinary Association	407, 786
Minnesota State Veterinary Association	785
Mississippi State Veterinary Medical Association	145
Missouri Valley Veterinary Association	623, 774
New York State Breeders' Association	787
New York State Veterinary Medical Society	277
Ohio State Veterinary Medical Association	649

	PAGE
SOCIETY MEETINGS—	
Pennsylvania State Veterinary Medical Association ...	398
Rhode Island Veterinary Medical Association	652
Schuylkill Valley Veterinary Medical Association	642
Tenth International Veterinary Congress, London	778
United States Live Stock Sanitary Association	520
Utah Veterinary Medical Association	408
Veterinary Medical Association of New York City....	143, 405, 645
Virginia State Veterinary Medical Association	648
Wisconsin State Veterinary Society	783
Soda, Tellurate of, in Cancerous Neoformations	95
Solipeds, Rabies in.....	296
Some Interesting Cases.....	613
Some Observations and Experiences with Hemorrhagic Septicaemia in Cattle.....	700
Some Thoughts on Veterinary Education	709
Spams of the Larynx.....	379
Spasms, Laryngo - Pharyngo-Oesophageal, in Horses.....	616
Standing, Chloroform	380
Sternum and Ribs, Fracture of the	383
Sting, Wasp	507
Stomach, Extensive Rupture of the	615
Stomach, Rupture of, in Horse, Caused by Blocking the Outlet of Ingesta in Determining Ingestion, Case Report.....	612
Stomoxys Calcitrans	297
Studies on the Virus of Hog Cholera	555, 684
Sub-Acute Diffused Meningo-Encephalitis in a Dog.....	511
Surgery, Abdominal	7
Surgery of Foreign Bodies in Oesophagus	423
Surgical Antisepsy with Tincture of Iodine	761
Surgical Treatment of Colics in Animals	19, 166
Team Work for Veterinary Legislation	162

	PAGE		PAGE
Tellurate of Soda in Cancerous Neoformations	95	Tympany of the Rumen, or Bloating: With a Prompt and Efficient Remedy	242
Tenth International Veterinary Congress	538	United States Government Meat Inspection	458
Tenth International Veterinary Congress, London	681	United States Pharmacopoeia, Proposed Elimination from...	607
Terrible Accident to a Race Horse	756	United States Senate, What Are We Going to Do in the?.....	301
Tetanus	604	Unusual Case of Constipation in an Aged Horse, Case Report..	374
Tetanus, Electrargol in.....	610	Unusual Sequela to Castration..	92
The Doping	151	Unusual Susceptibility to Cocaine	93
The Horse Doctor and the Man Doctor	771	Uruguay Veterinary College....	411
Therapeutics, Empirical	93	Use of Milk Cultures of B. Bul- garicus in the Prevention of Bacillary White Diarrhea of Young Chicks	194
Therapeutics of Parenchymatous Mastitis	232	Uterine Cyst in a Cow.....	618
Therapeutics, Physiologic Prin- ciples in	340	Uterus, Rupture of the, in a Cow	757
"The Tissue Medium," an Analysis of Dr. McLaughlin's Paper on	448	Vaccination, Controlling Chicken pox, Sore Head or Contagious Epithelioma by.....	330
Tincture of Iodine, Surgical Antisepsy with	761	Vaccination, Double Method in Anthrax Outbreak, Case Re- port	504
Tissue Medium	310	Vertebrae, Second Dorsal, Frac- ture of the, in a Horse.....	383
Tooth Fang, Arrested Develop- ment of, in a Bitch Due to an Injury, Case Report.....	600	Vertebral Column, Exostosis of the, Causes Hemorrhage of the Vena Cava	94
Traumatic Arthritis—Its Treat- ment	151	Veterinarians and Horse Breed- ing	670
Treatment of Capped Elbow....	420	Veterinarian, Artificial Insemina- tion and Its Relation to the..	237
Treatment of Pleuresy by Injec- tions of Air.....	381	Veterinarians and the Allied Horse Interests	304
Treatment of Pleuritic Effusions	240	Veterinarians, Cocaine Law and.	306
Treatment of Poll Evil Without Operation	615	Veterinary Association, New, Organized in Minnesota.....	457
Tribute to the Memory of James L. Robertson, from a Former Student	131	Veterinary Conference in Ithaca	541
Tuberculosis, Bony, of Fowls...	252	Veterinary Congress, Tenth In- ternational	538
Tuberculosis Microbe, Inborn or Specific, Aptitude with.....	531	Veterinary Congress, Tenth In- ternational, London.....	681
Tuberculosis, Outbreak of in Pigeons, Case Report.....	407	Veterinary Colleges Complying with Requirements of A.V. M.A.	46
Tuberculous Lesions, Rare, in Bovines	96	Veterinary Education, Some Thoughts on	709
Tuberculous Orchitis in a Horse	384	Veterinary Legislation of the Future or the Duties of the Veterinarian of the Future....	484
Tumors, Lymphadenitis and Multiple Cutaneous, in a Horse	90		
Tumors, Prethoracic and Ma- lignant	1		
Two Interesting Cow Cases, Case Report	87		
Tympany, Gastric	250		
Tympany, Gastric, in a Horse, Case Report	610		

	PAGE		PAGE
Veterinary Legislation, Team Work for	162	Veterinary Surgery, Human and Virus of Rabies.....	293 425
Veterinary Medical Association Meetings. 149, 289, 413, 529, 661, 795		Wasp Sting	507
Veterinary Medicine, Adrenaline in	156	What Are We Going to Do in the United States Senate?....	301
Veterinary Medicine, Yohimbine in	427	What Was It? Case Report....	754
Veterinary Science from a Country Practitioner's View- point	350	William Hunting, F.R.C.V.S....	436
Veterinary Service Bill, Army, Mark You This—The <i>Army and Navy Journal</i> Says Will Likely Pass	549	Wounds, Articular—Their Treat- ment	253
Veterinary Surgery, Grossich's Method in	760	Writing, Prescribing and Pres- cription	245
		Yohimbine in Veterinary Medi- cine	427

AMERICAN VETERINARY REVIEW.

OCTOBER, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

Paris, August 15, 1913.

PRETHORACIC AND MALIGNANT TUMORS.—If I can judge by the literature at my hands, these forms of affections are more common in bovines than in horses. Indeed I find that only 18 cases have been recorded in those last animals. Among them there were tumors of various nature, cancerous, lympho and fibro-sarcomatous, lymphadenoma. This last being most frequent. But whether prethoracic or mediastinal, and whatever may its origin be, lymphadenoma is a very malignant morbid entity, which can be met with in all the domestic animals and also in man and which may be accompanied with secondary metastasis, invading most of the tissues and organs and like epithelial cancer give rise to a neoplastic cachexia.

At the Société des Sciences Vétérinaires of Lyon a very interesting case of *generalized lymphadenoma of the mediastinum in a horse* was recorded, having been observed by two army veterinarians, M.M. Lesbre and Velu, with the assistance of adjunct Professor Roquet of the Lyon school.

I will present the clinical history of this extremely interesting case, as it is a valuable addition to the symptomatology of such tumors in horses, where the diagnosis is sometimes doubtful and difficult; especially when the neoplasm has not the tend-

ency to generalization and when its presence is only manifested by secondary anasarca, localized to the anterior quarters and almost always also by hydrothorax. In bovines these tumors are not rare; their symptomatology is now well known; it resembles much that of pericarditis by foreign bodies and the differential diagnosis may be rendered possible by examination of the heart.

*
* *
*

Gondole, a seven-year-old half-bred mare has never been seriously ill. One day she is found slacking in her ambition and is short-winded. In fact, after some hard work she is so unable to go on, that with great difficulty she is led back to her stable, where she arrives exhausted and literally broken down. After a few moments of rest, all the signs of illness have passed away and she settles down to eat her meal. Cardiac troubles are suspected. A short trot brings out again the same manifestations, hurried breathing, dyspnea, venous pulse, etc. Auscultation of the heart shows acceleration and violent beatings. Heart disease is diagnosed, digitaline and arsenious acid granules are prescribed. Eighteen days later, being taken out for a walk, she has a violent crisis with convulsive tremblings, acute moanings, etc. After this spell, which passed off rapidly, she remained about comfortable for a few weeks, although she is gradually losing flesh. At that time a new series of manifestation takes place. "At the point of each shoulder there appears flat swellings, circular, slightly œdematous, not adherent to the skin and corresponding to an hypertrophy of the prescapular and prepectoral lymph glands. This is followed after a few days by a swelling of the glands of the intermaxillary space, which rapidly increases and is then represented by a number of glandular tumors. With these swellings of the intermaxillary space and chest, a large œdema of the depending portions of the fore quarters develops and invades the head, chest and forelegs. The distended jugular veins are as big as a man's arm."

A diagnosis of interthoracic lymph gland adenopathy is made and the animal merely kept on observation without any treatment prescribed.

During the time that the animal remained under observation until death took place, some 8 or 10 weeks after, quite rapid loss of flesh was observed and cachectic condition gradually developed. The respiration had become slightly accelerated; the lower third of the chest was dull on percussion and silent at auscultation. Pleural exudation existed, and at various times was temporarily relived by theracentesis. Twenty-three litres of it being taken off altogether. The beatings of the heart were irregular, weak and not always perceptible. The pulse was filiform and intermittent. The temperature varied between 37° and 38° C. Micturation was frequent but not abundant. Towards the end of the disease ephidrosis appeared in the jugular grooves first and after on the flanks, the stifles, chest and arm-pits. These ephidroses disappeared one day, after a thoracentesis of seven litres being made, but it returned and spread as before. The mare died without violent struggling by dyspnea, after having been sick since October, 1912, to February, 1913, say four months.

*
* *

The post mortem of Gondole revealed a most generalized invasion of the entire lymph glandular system in various degrees. The glands of the right side being more affected than those of the left. Those of the thoracic cavity weighed 8,000 grams. They were the largest. Those of the right kidney weighed only 62 grams, and between these two figures came the other lymph glands of the body. One of the principal lesions was found at the entrance of the chest and on the mediastinum. It formed an enormous tumor weighing 8 kilograms and was formed of three large masses as big as a child's head with numerous secondary ones attached to it. The whole mass embraced the trachea, œsophagus, carotid and all the nerves surrounding. It

pressed on the jugulars, the axillary veins and the anterior vena cava, which was partly obliterated by vegetations, as if the walls of the vessel had been run through by the neoplasm.

All the other viscera were free from lesions. The pleura and lungs were normal. There was some fluid in the pleural cavity. The pericardium was not inflamed, but contained little fluid. In the heart the only lesion was a few nodules on the mitral valve. The liver was big, congested and weighed 10 kilograms. The spleen was twice its ordinary weight, 1 kilogram 800 grams. The kidneys were normal, except the right which contained a glandular tumor weighing 62 grams.

The histological study of the primitive tumor and of several of the secondary nodules has shown that in all, the same structure existed, namely that of lymphadenoma.

* * *

DR. CARRELL'S NEW EXPERIMENTS.—Their object is relating to the artificial variations of activity of conjunctive tissue in its automatic life. These were presented lately to the Academie de Médecine in Paris.

Already several months ago experiments of Dr. Carrell had demonstrated that a piece of chicken foetal heart was beating normally more than three months after the removal from the organism and that cultures of conjunctive tissue did rapidly grow in the beginning of the fifth month of their existence *in vitro*. These experiments were kept up. Colonies of conjunctive cells, from the same piece of heart, removed more than fourteen months ago, to-day develop with great activity after having been submitted to 166-167 passages.

The examination of the tissues formed by these cellular colonies showed the existence of a constant relation between the rapidity of their growth and the composition of the media. This fact indicated the possibility of regulating the rapidity of the proliferation of the conjunctive cells in the same manner as the activity of microbial cells can be modified.

The experiments were made with colonies of conjunctive

cells, which since a year were living outside of the organism and developing with a constant rapidity. Those tissues were submitted to more or less frequent passages in plasma alone of adult chicken or in one to which were added variable quantities of embryonic extract. It is known that these extracts, with also certain tissues of adult animal, have the property of activating, from three to forty times about, the rapidity of the growth *in vitro* of conjunctive tissue. After each passage the primitive piece was rapidly surrounded with a more or less wide areola of new tissue. The density of this remained about the same all through the last of the experiments.

The width of the areola which was formed round the original piece was measured with the micrometer or a photography of the culture was taken. The examinations and the mensurations were generally made forty-eight hours after the passage. Each experiment was rigorously controlled by a control culture.

The experiments can be divided into two groups according to the activity of the cell proliferation being reduced or increased.

* * *

1°. Colonies of cells, which became surrounded in forty-eight hours with a ring of new tissue, 0 m. m. 7 or 0 m. m. 9 wide, were cultivated in normal plasma of adult chicken. During the first forty-eight hours their activity diminished much. They were then submitted to another passage in an identical media. The growth became very slow; it was about 0 m. m. 115 in forty-eight hours, while it remained at 0 m. m. 9 in the control culture. The size of the tissue then ceased to increase, as, at each passage, a certain number of the cells were destroyed, and their losses, small as they were, were sufficient to take off from the tissue the gain of its slow growth. The mass could remain stationary for several weeks, and yet the cells continued to proliferate. Sometimes the proliferation would stop entirely and the tissues would die. The plasma of adult animal would not permit a marked increase in the mass of the cell colonies

which were cultivated. A diminution in the activity of the tissues could also be obtained by keeping exposed to a temperature of 35° - 36° C. instead of 39° , or in exposing them for four or five days to similar surrounding temperature. The colonies of cells, whose activity had thus been reduced, continued to proliferate slowly, when kept in that same surrounding. But if they were placed in their ordinary media, they would regain their original activity after a few passages.

*
* *

2°. The addition to the normal plasma of an adult animal of a small quantity of extract of tissue produced at once an increase in the mass of the cell colonies. A piece of tissue cultivated in a media composed of two parts of plasma and one of embryony extract, slightly diluted, is in forty-eight hours surrounded with an areola of new cells, whose width is about 0 m. m. 9 and keeps increasing very rapidly. In a few days it is double its size, and it became necessary to divide and subdivide it. When more condensed extracts of tissues were used or again if the colonies were submitted to daily passages, during several days, they would, in forty-eight hours, produce a ring measuring 1 m. m. 5 and even 1 m. m. 80 in width. In this last case the growth of the conjunctive tissue was forty times more rapid than with normal plasma. The increase in the mass of tissue during this short period is wonderful. In other cultures the rapidity of the growth was even greater, and to such an extent that the quantity of conjunctive tissue, formed at the expense of the media, was relatively enormous. *This great increase of size proved that, in these experiments, they were not phenomena of survival, analogous to those observed by Carrell and others, but that it was a new fact, namely that of conjunctive cells living and multiplying indefinitely in their media of cultures as microbes do.*

*
* *

Those experiments then have shown that colonies of conjunctive cells which have lived more than one year outside the organism, had kept their faculty of increasing much in size and of giving birth to quantities of other colonies. They also have shown that the rapidity of cell proliferation can be regulated as easily as the activity of micro-organisms. Those cell colonies, in a given and constant state of activity, will, without doubt, facilitate the study of the physico-chemical factors in the growth of tissues and may perhaps, one day, serve as reactive for the diagnosis of the dynamic properties of the tissues and humors of the organism.



ABDOMINAL SURGERY.—Abdominal audacious surgical interferences of almost all kinds are so common in human medicine that the most delicate and the most serious are often recorded without receiving the attention that they deserve.

In veterinary medicine, since the days of asepsy and antiseptics, operations on the abdomen have become more frequent. Common for smaller animals, they even have made their way for larger, and it is not unfrequent now to read in our professional journals records of cases of laparotomy, enterotomy, etc., many of which have been followed by recovery. I have just come across one in "*Il Moderno Zooiatro*," which I think deserves publicity.

The record is headed "*On the Diagnosis and Surgical Treatment of Enterolithiasis in Solipeds*," and relates a clinical observation of unusual interest, because: 1° a double operation, laparotomy and then enterotomy were performed on an animal over fifteen years of age, which had an intestinal calculus of enormous size, weighing 7 kilograms 845 grams, say over 15 pounds and a half. The operation was followed by radical recovery: 2° because the diagnosis of intestinal calculus was made out by external manipulations; 3° because the seat of the calculus in the cæcum was made out and confirmed by the opera-

tion, a localization, which explains how such an enormous stone could have remained so long in the organism without preventing the passage of the food and giving rise only, now and then, to slight intermittent colics.

The operation is thus described,

* *
* *

The mare was bay and fifteen years old. She was brought to the veterinary school for being lame. While she was examined a peculiar deformity, in the profile view of the inferior abdominal wall, was noticed on a level with the xyphoid cartilage of the sternum. By palpation, the presence of a very heavy and large mass, slightly mobile, was made out. Rectal examination was negative. A diagnosis was made of intestinal calculus, located in the diaphragmatic curvature of the colon or the anterior portion of the cæcum. The owner, telling the history of his mare, stated that after meals she was subject to abdominal pains of short duration.

The mare was abandoned to the school and Prof. Pietro Ghisleni decided to operate on her.

The animal, properly prepared, was cast on her back and brought under the influence of ether. Laparotomy was performed, an incision being made, 30 cm. long, a little on the left of the median line and extending from the xyphoid cartilage to in front of the umbilical cicatrix. After laceration of adhering tissues, both hands were introduced in the abdomen, but even with the aid of an assistant the calculus could not be raised from its position, and the operation was given up. The wound was properly secured and dressed and complete healing obtained in twenty days.

Two months later a second operation was attempted. The animal was thrown on her right side and anesthetized with ether. An incision was made on the left abdominal wall, parallel to the linea alba, a little above the cicatrix of the first laparotomy. The calculus was then found located in the anterior part of the cæcum.

An assistant introduced his arm in the abdomen and with both hands of the operator the mass was brought outside. The contents of the cæcum were pushed upwards towards its base, a strong ligature was applied on the organ to prevent their falling back and also one towards the point of the cæcum. The intestinal walls were then incised and the stone extracted. The sutures of the intestines were carefully applied, serous against serous, and the wound of laparotomy closed. The stitches were removed after 12 days and a complete cicatrization obtained in 20. The mare went to work and never had colics after.



CANINE ISO-SEROTHERAPY.—A new application, which deserves attention, is that which has been made and recorded at the Société de Pathologie comparée by MM. Lepinay and Beausillon.

Very interesting results have been obtained in human medicine in the treatment of some affections with the use of human sera, such as in the accidents of pregnancy, gastro-enteritis and broncho-pneumonia, which were favorably influenced by injections of serum from healthy men or women, free from tuberculosis or syphilitic tares.

From these data the authors of the article had decided to experiment on dogs, with canine serum, obtained by centrifugation or decantation, with blood taken from the saphena. This serum possesses the maximum of properties, when it is used fresh, immediately after the bleeding, as it still contains a certain quantity of thrombine, a coagulating substance of superior excellency.

It is to hypodermic injections that the authors resorted in preference, as the mode of administration. These injections are well supported, are not painful and leave no marks. At the most, they may bring in twenty-four hours a thermic elevation of one degree, which disappears rapidly. A dose of 5-10-15 cubic centimeters is injected on the inner side of the thigh and can be repeated several times in succession, without bad effects or

inconvenience. Following the absorption of the injected fluid there is a noticeable increase of globular percentage in the blood, in the hematos and leucocytes, and the coagulating properties of the blood of the animal treated are well elevated.

In hemorrhagic enteritis, which is so frequent during attacks of distemper, in post-operative hemorrhage such as after the amputation of the ears or removal of tumors, etc., most satisfactory results have been obtained. Even in these last cases the internal administration may be rendered more perfect by the application of serum with the dressing.

As it has proved that "if the day after a copious bleeding, serum being taken during the full hematic crisis of regeneration and injected into a fresh animal, this would present twenty-four hours after the injection a great and lasting hyperglobulia," the authors have by successive bleedings prepared homopoietic sera, which, when injected into healthy dogs, gave rise to great hyperglobulia, the number of hematos being raised from 4 or 5 millions to 6, 7 or 8, and that of the leucocytes from 8,000 to 10,000 to 25,000 and 30,000.

On the day following, the red globules still increased in number, and 10 or even 12 millions could be counted. After 10 or 12 days the equilibrium had returned.

By this treatment anemic animals have been benefited, recoveries and improvement during distemper were obtained and intestinal hemorrhages were rapidly arrested.

These results that the authors record are very encouraging and certainly deserve attention, as the application of the method may prove a valuable means to reinforce the resistance of animals against the invasion of microbial germs and perhaps be of great advantage in general practice.

* * *

BIBLIOGRAPHY.—The report of the NEW YORK STATE VETERINARY COLLEGE for the year 1911-12 is as complete as it can be made and shows the great and valuable amount of work of the institution.

Director Dr. V. A. Moore, addressing the report to Acting President T. F. Crane, after concise generalities, considers the subject of the faculty, the statistics relating to the number of students and the standing of the graduates, the plan of instruction and the arrangements of the three years of studies, then the diagnosis work, the examinations relating to some contagious diseases, the distribution of sera, and concludes with the consideration of the needs of the college and the recommendations that are indicated.

This part of the report is interesting in a general way. The appendix, which forms the largest part of the volume, speaks of the real work in some details and is the part which will attract the attention of veterinarians, of intended students and of scientists of both medicines, human and veterinary. After the reports relating to the practical teaching in the clinics by Prof. Williams, there are a series of articles from Director Moore, Professors Fitch, Burnett, Frost, Bolton, Birch and Jones on various subjects, such as glanders, arterial scleromatosis, abortion and sterility in cattle, etc. Several of these articles are handsomely illustrated.

The report is one which other similar institutions ought to take as model to show their work.

* * *

I have also been favored with the report of the VETERINARY DIRECTOR-GENERAL AND LIVE-STOCK COMMISSIONER, Dr. J. G. Rutherford, for the year ending March 31, 1912. It is a large volume of nearly 500 pages with a few illustrations, where our worthy confrère, Dr. Rutherford, has collected the great amount of good work carried out under his directions by the excellent staff of veterinarians he had with him. There are contained in the book many interesting reports.

* * *

Quite an interesting volume has been received also from PARKE, DAVIS & Co., the great firm of Detroit, that every veteri-

narian knows, whose title says in a few words the object: "*Collected Papers from Research Laboratory.*"

It is a neat book of nearly 300 pages, gathering the reprints of the valuable work done by the investigators of the laboratory of this firm, as they have been published in several medical and veterinary papers in the United States and in England.

The idea of collecting all these publications into one volume is a very good one, as one may at once find out those which may be of special interest, without being obliged to inquire and look, some time without good success when and where such papers have been published.

This volume is numbered as the first, which indicates that others will follow. They will make a good addition to any library.

* * *

Other Acknowledgments.—Bureau of Animal Industry, Bulletin 166 on *Chemical Changes Produced in Cow's Milk by Pasteurization*, by Dr. Philip Rupp, Ph. D.

Veterinary Notes for June, 1913.

Archives des Sciences Biologiques of the Imperial Institute of Experimental Medicine of St. Petersburg.

The West Australian, with a valuable contribution by Dr. E. A. Weston on the use of tuberculine test.

A. L.

A GOLDEN LEGACY—TO THE PURPOSES AND POSSIBILITIES OF WHICH WE HAVE NOT BEEN INSENSIBLE.

The closing meeting of the first half century of the life of the American Veterinary Medical Association has passed into history; and, with a thousand persons in attendance, including the ladies that graced the occasion with their presence, and the

scope and character of the work accomplished, has set a pace for those that are to come after it that will permit of no relaxation of the energy that has characterized its work in the past. Nor do we anticipate any; for the noble pioneers of our profession who laid the foundation of this splendid organization fifty years ago planned better than they knew, and so through these fifty years it has gone onward and upward, each year's gathering marking an advance of the previous one, and so it will continue down through the next half century, yearly increasing the breadth of its work and the extent of its usefulness in developing and elevating veterinary science, until it shall have reached a first place among the learned professions.

Let us glance back over the activities of this last great meeting and endeavor to determine whether its accomplishments have been in keeping with the greatness of the occasion; the return to the scene of the association's initial activities, after fifty years, during which it has pitched its tent in every quarter of the United States and twice on Canadian soil.

Would the character of this conference, held upon the old camping ground of the group of practitioners who laid its foundation there half a century ago, meet with their approval? We feel sure that it would. We feel further assured that it would have surpassed the hopes and ideals of the most sanguine of them, could they have but beheld that great congress of veterinarians in New York last month and followed them through the immense amount of work that was accomplished, and the manner in which it was accomplished in those five days. We have referred to the organizers as a group of practitioners, and such they were; ideal practitioners; broad thinking men, filled with an ambition for greater scientific attainment by their profession; and could they have been present at this Golden Anniversary meeting of the association which they organized, they would have seen that their ambition had been realized (*greater scientific attainment by their profession*), with the group of practitioners (only a very much larger group than the original one) still occupying a central place in the organization, flanked on every

side by those whose live work has taken them along lines of investigation of subjects which, while perhaps more properly classed amongst scientific research work, still are directly related to, and are part of the everyday life of the practitioner. Each is equally important to the other. For example, had they peeped into the room where the section on Sanitary Science and Police were in session, they would have observed that all the practitioners that could squeeze in were present, listening just as intently to papers presented by pathologists and others on subjects of vital importance to them as they did in the sections on medicine and surgery. In short, we were impressed by the very patent evidence of the breadth and scope of the fiftieth anniversary meeting of the American Veterinary Medical Association, and its healthful condition, manifested by its literary programme. No subject was too scientific and technical, nor too practical and commonplace, to merit a position on it. Every phase of professional interest was represented. We were further impressed with the great importance of this national organization as an educational factor. We all know of its great service in the elucidation of subjects of national importance, but how many of us realize how much of an individual educator it is to each of those who attend its sessions closely. Local organizations are apt to be made up of members whose interests and daily tasks are more or less in common. Here is a society made up of city practitioners, there another of country practitioners, and still another of B. A. I. men. And still other veterinarians, whose work has gotten them into the channel of pathology and bacteriology, become members of associations of that character, such as the Pathological Society of their city and the Society of America Bacteriologists, etc., etc. The result naturally following that each of these groups are developing more strongly in certain directions; and they come to the American Veterinary Medical Association meetings each year to discuss the subjects in which they have been working during the interval that has elapsed since the previous one. What is the outcome? A *general* exchange of advanced ideas such as cannot be obtained in any

other way. So that the American Veterinary Medical Association has broadened its scope to a point where, in addition to benefitting veterinary education by raising the standards of the veterinary schools, it also does so by stimulating the members of the profession in general to wrestle with the vital questions of the day, that they may be in a position to present them to better advantage at each succeeding annual convention. The result of that stimulus was plainly evident in the direct, clear manner in which subjects of such vital moment (not alone to the veterinary profession, but to the general public) were presented at the fiftieth anniversary meeting. This has not come suddenly, but is the result of the continued annual association with each other of men from all over the country who are looking at and studying things from diverse viewpoints, and frequently under vastly different conditions. There is nothing new or strange about this that prompts us to speak of it at this time; it is merely referred to as another instance of the inestimable value of the Golden Legacy left us by the men who met in the Astor House on June 9, 1863, to make plans for the realization of *greater scientific attainment by their profession*. We regret exceedingly, therefore, that the one living, active member who was present at that first meeting could not have been present to have seen the direct, lucid manner in which the following questions, equally vital to the veterinarian and the whole people, were presented and dealt with; while we realize the great sacrifice he has made uncomplainingly, because a higher, nobler duty made his presence impossible. Take the glanders question, for example. Veterinarians in large cities throughout our country have seen millions of dollars worth of property taken away from the merchants, manufacturers, contractors, men in all mercantile lines in fact, to say nothing of the family pets, family horses and children's ponies that have had to be sacrificed by this dread disease. And in addition to this loss from a commercial aspect, they have seen human beings succumb to this loathsome plague. It has aroused them, and they have been laying their cases before the national organization each year for some years back; but not

until our retiring secretary organized the section meetings, which had been under consideration for some time, was the national organization in a position to handle these big questions as it is to-day. Now each section sits as a special tribunal, under the direction of a specially selected man especially suited by his life-work, to assist in the elucidation of questions to come before his section. The same applies to those who are to present the questions. The result is, that those seeking information get it from the most authoritative sources, presented in the clearest, most precise and direct manner. We have referred to the glanders question. Now let us see how that question was prepared and presented at the section to which it was assigned.

In the first place, a *special committee was appointed by the president soon after taking office (nearly a year before the meeting at which it was to report), "*For the Detection of Glanders.*" The personnel of this committee is most interesting, and indicates its peculiar fitness for the task of collecting and presenting educational facts in relation to glanders. E. B. Ackerman, Chairman, general veterinary practitioner in a large city for the past twenty years and veterinarian to the Contagious Disease Division of the Health Department of that city during practically the same period of time; Adolph Eichhorn, Senior Bacteriologist, Pathological Division, Bureau of Animal Industry, at Washington, D. C.; C. D. McGilvray, practitioner of veterinary medicine, engaged in municipal sanitary regulation work and teacher of veterinary science; Charless Cotton, general veterinary practitioner in large city, and engaged in glanders eradication work; Charles Keane, State Veterinarian and teacher in a veterinary college; John Reichel, Veterinarian, Bacteriologist and Pathologist. These are the men who had been busy for a year compiling facts for their report before presenting it, in which report they studied glanders from fourteen points, as follows: (1) Cause. Variation in Virulence; (2) Animals Susceptible; (3) Period of Incubation; (4) Modes of Infection; (5) Manifestations, Symptoms, Prognosis; (6) Diagnosis: Mallein—Subcutaneous,

* Report will be published in a subsequent issue of REVIEW.

Ophthalmic, Cutaneous; Laboratory—Cultural, Animal Inoculation Test; Blood Test—Opsonin, Conglutination, Precipitation, Agglutination, Complement Fixation; (7) Differential Diagnosis—Clinical, Laboratory; (8) Pathological Anatomy; (9) Quarantine—Clinical, Occult and Exposed Cases; (10) Disposition—Clinical, Occult and Exposed Cases; (11) Treatment; (12) Disinfection; (13) Retesting and Subsequent Control; (14) Regulations—State and Federal.

We also direct attention to a résumé *On the Control and Eradication of Glanders*, presented at the request of this special committee, published in this issue of the REVIEW on page 72. In addition to which, many papers were presented by individual members, of the highest character; dealing authoritatively with glanders from every point of view.

The scope of the work of this committee suggests the manner in which all the vital questions have been studied. The commission appointed by President Rutherford at the Chicago meeting four years ago on the Control of Bovine Tuberculosis, the personnel of which was published in the REVIEW at that time, and their accomplishments in the first year, are matters of history. That commission, with slight changes in its personnel from year to year, is still retained and doing excellent work. Other prominent members, both in connection with committees and as individuals, who have devoted a considerable amount of their life and energy to other contagious diseases that materially affect the commerce of our country, presented equally well-prepared papers on such conditions as Hog Cholera, Chicken-pox, Contagious Abortion, Dourine, etc. And so we might enumerate many more examples of the advanced methods of presenting medical facts and conducting the affairs of the association at our annual conventions that we are sure would commend themselves to the founders of the association, and make them feel very happy indeed at the manner in which their work had been extended during the past fifty years in which it has been left in the keeping of their followers and successors, and make them feel fully confident as to

its future in the second half century upon which we are entering; but will content ourselves for the present in voicing the sentiment of the whole profession, by thanking God, from whom all blessings flow, for the greatest blessing that could have fallen upon the American veterinary profession, the Golden Legacy, in the form of a working plan upon which to build our professional edifice, conceived and executed by the little band of loyal members of our calling in its early history in this country. Not forgetting the principles upon which they organized, as expressed in the motto which they adopted at the time and exemplified in their works—*Non Nobis Solum*, not for us alone.

ALUMNI ASSOCIATION TO BE REORGANIZED.—President Chase, of the Alumni Association of the New York-American Veterinary College, which by an act of the legislature became a state institution in May last, called a meeting of the alumni (which includes graduates from the New York College of Veterinary Surgeons, the American Veterinary College and the New York-American Veterinary College) at the Hotel Astor during the session of the A. V. M. A. the first week in September, with the object of reorganizing the association in the near future. Nearly fifty members from amongst the attendance at the A. V. M. A. responded to the call, and an interesting session was held. The history of the school, it was thought, would be of interest to the alumni, and members present were asked to furnish, as far as possible, data on the life-work of members of their classes to the secretary. With the object of assisting the officers and members of this association in carrying out their plans to a successful end, we urge upon every alumnus of the New York College of Veterinary Surgeons, the American Veterinary College and the New York-American Veterinary College to furnish to the secretary, Dr. Percival K. Nichols, 107 Harrison avenue, Port Richmond, New York, all the information they possess about any members of their class, as well as of themselves; such as whether engaged in general practice, city, state or federal work, teaching at agricultural or veterinary colleges, etc., etc. Just a little trouble on the part of each one, will be of an immense amount of assistance to the officers of the association, and the production of such an historical sketch of the accomplishments of the school through its alumni since 1857 will be extremely interesting and instructive.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF COLICS IN ANIMALS.*

By L. A. MERILLAT, CHICAGO, ILL.

INTRODUCTORY REMARKS.

I am using this title, for want of a better one, to present a brief review of the available forms of instrumentation useful in the management of gastric and intestinal obstructions of animals, and I trust you will not be deceived by this startling headline. "The surgical treatment of colics" might easily be mistaken for more than I shall be able to disclose as rational treatment of a surgical character for intestinal and gastric ailments. Let me therefore first announce that this epitome is not a startling proclamation about the invasion of intestinal diseases through the abdominal wall. On the contrary, as Prof. Hobday† has told you, and as you have been warned by Dr. Blattenberg, we are not today and probably never shall be able to invade the abdominal viscera to any great extent.

One of my objects is to draw your attention to the necessity of diagnosing abdominal diseases with more certainty at an early stage in order that we may attack them with a therapy directed precisely at the affected spot. Colic, I dare say, in veterinary practice is too frequently treated as such. I have often thought if the word "colic" had never entered our nosology we would then have approached abdominal pain with a more searching inquiry as to the nature or causative condition and then we would all of these years have been treating causes instead of eternally seeking a medicant to cure the effect. Colic in animals has usually been considered as a mild or overwhelming abdominal pain as

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

† See article published in this issue, beginning on page 47.

the case may be, and too little attention has been paid to the underlying cause. Our weakest point in the management of colics is our inability to diagnose the cause and seat of the obstruction at a stage early enough to put direct, effectual treatment into operation before it is too late.

The conventional treatment of most all colics is the administration of a pain-killing potion, and then if this is not followed by a cessation of the pain an evacuant is thought necessary. When these two things fail the patient dies. The pain-killing dopes are usually morphia, cannabis Indica or chloral, and the evacuant anything from a violent hypodermic injection of eserine, arecoline or pilocarpine to a large drench of linseed or castor oil. And, yes, when there is bloating carminatives and antiferments are given, and if the bloat is threatening, a trocar and canula is thrust into the right flank. These presents, with a few variations in the selection of drugs, constitute our standard treatment of colics to-day, and these treatments are so strictly conventional that almost any one of ordinary intelligence could master the entire system after a few days of instruction. In fact we all know of handy fellows in veterinary hospitals and large establishments who manage colics quite up to the prevailing standards.

Now, gentlemen, this is not as it should be at this day of sane therapeutics. We should now accept the burden of studying observations on our patients sick with abdominal diseases with a view of determining the exact nature of the condition responsible for the pain. Post mortem after post mortem held on animals dead from colics show too often how wide of the mark our treatment had been and how useless were our efforts to turn the tide toward a recovery if we did succeed at a late stage to discover the cause. Very often these post mortem investigations show that a vigorous attack at the affected spot right from the beginning might have been effective. By exclusion we do sometimes, after a patient has suffered for some time, make a correct diagnosis, but then it is usually too late to effect a cure. In short, the cases are already beyond hope and out of reach of any treatment when the diagnosis is made.

The better management of abdominal diseases must come through an intensive study of symptoms and groups of symptoms coupled with probable cause which will enable us to determine early in the march of the disease the exact seat and the exact nature of the trouble.

Abdominal Pains Misleading: Abdominal pains are, to say the least, very misleading, I must admit. Even in human beings, where the symptoms are subjective, grave errors are often made by the treachery of pain. For example, an appendicitis patient may complain of pain in the left loin or over the solar plexus. The location of pain, in fact, gives no assurance that the lesion is at the same point. So misleading are these expressed manifestations that only the specialist seems able to properly interpret them. In animal patients we may actually be thankful to be rid of this group of subjective symptoms. In truth we are at no loss whatever in diagnosing the seat of abdominal pain for want of them. I am certain after many observations covering a good many years amongst animals sick with colics that the objective symptoms presented by animals if properly studied and if properly grouped and then coupled with the probable cause can be depended upon as fairly diagnostic of special conditions even at the early stage of painful abdominal diseases. And it is largely in this direction we must turn our attention if we would arrive at that "refinement of diagnosis" upon which all sound treatment must be based. In short, we are now face to face with the problem of differentiating pain in the alimentary canal within the abdomen in regards to the exact location of the cause. Pain in the stomach should be differentiated from pain in the colon, and that from pain in the small bowels, etc., etc., and that at a very early stage of the colic. With these difficulties out of the way the treatment of colics would at once be simplified into a more effectual attack of the actual trouble. And while I admit that perfection in making these differentiations need not be expected, it is only by developing a more inquisitive disposition toward these phenomena that we may ever hope to become sufficiently proficient to bring our treatment of intestinal obstruction up to a worthy standard of excellence.

Inspection and Palpation: And in addition to the manifestations of pain there are other valuable recourses. Inspection of the abdomen often aids materially in arriving at positive conclusions as to the seat of the trouble, and while deep abdominal pressure, depended upon so much by humans, is only of service in small animals, we have here the advantage of explorations per rectum which will yield a great wealth of diagnostic information to any one who will but practice this method of searching for abnormalities diligently. To the unskilled hand all rectal explorations are alike, while the hand of the experienced diagnostician is capable of making wonderfully accurate deductions from them. In the earlier days of my career as a practitioner I doubted the possibility of recognizing a twisted colon, but after having read positive statements from others, especially European writers, I began to become more inquisitive and finally discovered that torsion of the colon is not only easy to diagnose, but the exact direction of the twist can be determined with precision. And so it is with many other conditions if we would only search for them more often than we are in the habit of doing. The rectal and vaginal routes offer a wide field for explorations which are fruitful or useless, in accordance to the training the hand has received. The condition of the large colon, the small colon, the cæcum, the inguinal rings, the kidneys, the uterus, the ovaries can be determined by them. Impactions, growths, cysts, calculi, torsions and abscesses can be diagnosed in this manner. Why then wait for the autopsy for a diagnosis with this wide open route available during life?

Then we may take advantage of exploratory punctures and stomach catheterizations in many instances to determine more accurately the nature of alimentary disorders of an acute character.

This paper is not designed as a discourse on diagnosis, but I can not very well introduce my subject as logical without first showing the possibility of locating the seat and cause of abdominal pain with a degree of accuracy that would warrant the recommendation of treatment by instrumentation. A surgical operation is only justified when directed at a definite object, and

when this object can not be located accurately then the surgeon must leave the condition in the physician's category. On this account the following remarks deal at some length with the diagnosis of the condition the operation is intended to cure.

The Stomach: The stomach of animals is subject to the following disorders which cause acute pain:

1. Overloading of the stomach of work horses, almost universally called "Acute Indigestion" in this country.
2. Impaction of the stomach of horses.
3. Acute gastritis of horses.
4. Acute dilatation of the stomach of horses.
6. Impaction of the rumen of all ruminants.
7. Foreign bodies in the stomach of dogs and cats.
8. Foreign bodies in the rumen.

It will be noticed here that without going beyond the stomach we already find that eight definite disorders, each of which I shall endeavor to show belongs to the list of surgical diseases. Some of them may yield to medical treatment, and when of a mild type may still properly remain in the list of medical diseases, but when they are grave the aid of the surgeon must be enlisted or the patient will not survive. Let us analyze them separately:

Overloading of the Stomach of Work Horses: Acute indigestion, so-called, is so well known to all practitioners that its symptoms need no special description here. It is so characteristic and its characteristics are so well known that there is little chance to mistake it for any other disorder. Oesophageal obstruction (choke) in the very first stage and poisoning with aconite are the only two conditions for which it might by chance be mistaken, and these are very easily excluded by a little study. The eructations of gas, the activity of the œsophagus in the cervical region, the distended abdomen which may be slight or threatening, the colicky pains of a fairly acute character, occurring in a horse after a day's work, sometimes before and sometimes after having eaten the evening meal, is a clinical picture that is at once recognized as an overloaded stomach. The volume of water and feeds are too great for the exhausted stomach to handle. Gases

pass readily from the stomach into the bowels and these too become bloated. In the more formidable cases large quantities of chyme are washed into the intestinal tract, until all of the bowels as far back as the floating colon are teeming with a fermenting process.

Treatment: Mild cases may take a favorable turn without any treatment, and will usually respond to the administration of antiferments, of which salicylic acid, recommended by Quitman, is probably the best; but when the attack is of a severe type only radical measures taken promptly will prevent a fatal termination. The radical measures to which I refer are catheterization of the stomach and puncture of the colon if bloating is threatening. Catheterization of the stomach is practiced extensively in this country, but in spite of its merits as a radical cure it has by no means been universally adopted as the standard intervention against an overloaded stomach, as it should have been long ago. Here is an operation that goes to the "fountain-head" of the trouble and without ceremony removes it from the body. To fight a stubborn fermentation in such a mass of chyme and then start the whole volume through its long course to the rectum by means of drugs seems criminal with such a splendid operation available. Those who have practiced this operation have little patience with the uncertain and slow medical treatment. Stomach catheterization not only evacuates the harmful contents but it also lowers the abdominal tension, and besides the dilution of the chyme with water controls the fermentation more effectually than any other form of antiferment treatment, and leaves what remains of the mass in a better physical condition for the intestines to handle. And often animals almost dead from acute indigestion, destined by the medical treatment to go through a prolonged agony sometimes ending in laminitis, are cured immediately and ready for work in a few hours.

The Sequels of Stomach Catheterization: The sudden evacuation of the overwhelmed viscera, particularly of several hours' duration, may be followed by *fatal shock* on resumption of the splanchnic circulation that had been dammed up by the pressure.

It may be mild or serious, according as the causes and condition of the patient chance to operate. An old subject or one systemically weak from continued hard work that has suffered two or three hours from an overloaded stomach if suddenly relieved will begin to show symptoms of collapse from one-half hour to six hours after the operation. The weakened viscera overcome by the prolonged stretching take more than their share of the blood volume, and this at the expense of the periphery. The result is shock; but this may very frequently be prevented by injecting large volumes of hot water into the stomach after the harmful contents have been removed. The sudden relief of a badly overwhelmed abdomen is a hazard at all times when this precautionary treatment is omitted.

Laminitis is of course always liable to follow such a disorder, and while catheterization of the stomach does not always prevent it we have found that the installation of alum—5 ounces—in solution as a parting step of the operation is markedly presented. In our practice stomach catheterization has even been charged with causing laminitis, but the reason we had so many cases at first is due to the fact that before we practiced stomach catheterization these bad cases died before laminitis could develop. When we began to prolong the life of these otherwise fatal cases we found that some of them fell victims to this complication. Now, alum has come to our rescue. Alum for laminitis was first given, to my knowledge, by Dr. Douglas, of New Orleans. Since he announced this remedy several years ago it has come into pretty general use in the west. I heard of it in California last winter, where at least one veterinarian administers it in doses of one pound. A third sequel is *acute dilatation* of the stomach, of which I shall speak later.

Impaction of the Stomach: Impaction of the stomach is a condition I fear veterinarians have too frequently failed to recognize. It is invariably referred to as senile trouble in our literature and is usually attributed to chronic dilatation of the stomach and in animals fed exclusively upon a dry fibrous forage.

While such is often the case under which the disease is en-

countered it is by no means limited to old animals. We have found numerous grave impactions in young, vigorous horses with great frequency. Straw, hay, shredded fodder, coarse ensilage, alfalfa or even clover hay, partaken of ravenously, is the usual cause. The cases in our urban practice are found chiefly amongst horses in small establishments where the food is carelessly or irradically allowed, that is, a spare ration to-day and a liberal one to-morrow. In short, the hungry horse after a day or two of hard work and privation, suddenly given access to a full manger is found sick with colic the following morning or falls sick in the harness during the next day.

The symptoms of this affection are characteristic. The pains are fairly acute, and as the patient finds no comfort in the recumbent position, it is continually up and down. There is always a marked perspiration about the neck and shoulders. The respirations are short and the nostrils widely dilated. Sometimes there is a grunt heard in the exhalations, particularly while the patient is recumbent. The absence of abdominal distensions to account for this distressed respiration is in fact pathognomic when coupled with the above symptoms. There may be some bloating of the right flank that becomes more pronounced as the disease progresses. But the bloating is never sufficient to account for the grave condition of the patient, and only momentary relief is afforded when it is evacuated with the trocar and canula.

Treatment: Allowed to run its course or under the usual medical treatment usually administered for colics, impaction of the stomach runs rapidly toward a fatal ending. Especially eserine by further exhausting the stomach in the futile contractions to expel its contents is always disastrous, and so with any of the powerful drugs resorted to for serious colics. Oil and purgatives afford no relief whatever.

The only remedy I have found to turn these fatal cases toward recovery is to patiently liquefy the impacted mass and endeavor to aspirate it out through the tube. The operation requires patience, as this feat cannot be immediately accomplished. The injections of two to three gallons of water into the already full

stomach may actually increase the patient's agony, but after a long time, when the water has had time to distribute itself through the mass the injection of additional quantities of water will begin to bring out food particles in the reflux and finally, as the softening process continues, more will flow out. After patient attempt without success, a second or third attempt may be made at intervals of an hour. As much as forty to fifty pounds of solids may thus be removed from the stomach and place an otherwise fatal case toward recovery.

Such patients are, however, invalids for some time, and are subject to subsequent attacks of colic, probably due to chronic dilatation.

Acute Gastritis: Acute gastritis is the most severe as well as the most fatal of colics if not promptly recognized and relieved. It is seen under two distinct circumstances. First, after a hard day's work or long tiresome journey; and secondly, after eating tainted food. Sometimes these causes operate together. Ground feeds containing poor qualities of corn, oats, barley and mill feed are responsible in many cases, particularly when there is a sudden change to these feeds.

The patient is stricken on the road or soon after having reached the stable, and always before having eaten the evening meal. The patient suffers horrible agony and cannot be controlled, thrashing about in a terrifying manner. There is usually a threatening abdominal bloat that calls for immediate relief from the trocar and canula. This operation gives only a momentary comfort. Belching is not a constant symptom, although there is generally a perceptible activity of fluids in the œsophagus. The respirations are accelerated, the nostrils dilated, the body bathed in perspiration, the temperature is already elevated to 104 or 105 degrees Fahr., and the mucus membranes are highly injected. In hot weather the body temperature is sometimes very high, as this disorder may be associated with overheating of the body.

Treatment: The pathognomic symptom is found in the course of the treatment, which consists of the prompt washing out of the stomach with the stomach tube and pipe. The contents

which usually flow out as soon as the tube reaches the cardiac orifice are blood-stained with the exudates from the inflamed mucus membrane. It is sour and flows out in sufficient quantity to afford an immediate relief. As the tube enters the stomach the patient, until then in great agony, immediately stands quiet. The volume of solids evacuated from such a stomach is always small and can in no way account for the patient's agony. The agony is the agony of inflammation and not entirely of engorgement, as in acute indigestion. The stomach should be well washed out by alternate installation and aspiration of hot water until the reflux is clear, and then several gallons of hot water are injected to fill the stomach against a too sudden reaction of the gastric circulation. In these cases we also use alum solution to prevent laminitis. One-half to a grain of strychnia is helpful, and in twenty-four hours a small dose of oil of linseed is given to prevent the constipation that may follow two days hence.

Acute Dilatation of the Stomach: Acute dilatation of the stomach is a sequel of the above disorders and is due to an exhaustion of the muscularis from the severe and especially prolonged stretching to which the stomach was subjected. In some instances the walls give way to the stretching and rupture occurs. Dilatations follow stomach colics in which there is little or no bloating in the bowels or when the bloat in the bowels is suddenly relieved by evacuation of the gases with the trocar and canula. As long as the stomach is pressed upon by bloated bowels its walls are supported against stretching or rupture, but when bloat is absent or is relieved, it distends in a backward direction and either stretches into a serious dilatation or else gives way entirely. It is therefore important in treating overwhelmed stomachs to relieve the distention by catheterization and then if necessary attend to the gases in the large bowels. To reverse these operations is a hazard.

Every bad case of acute indigestion, impaction and gastritis is followed by more or less dilatation with which the surgeon in charge should reckon. If the vigorous subject is given prompt treatment of the proper kind, the stretched organ almost imme-

diately resumes its normal state and is ready to functionate in the normal manner; in others the reaction requires several days and in some it runs rapidly to a fatal end or leaves the stomach a prey to frequent attacks and a victim of chronic indigestion.

In order that I may not be misunderstood, I should mention here that we use the phrase "dilatation of the stomach" to designate exclusively the stretched stomach that does not immediately contract after the material and gorging has been removed. The term is used, notably by Hutyra & Marek, as synonymous with engorgement of the stomach whether the organ is damaged by the stretching or not, while here I am restricting its meaning to the more or less permanent damage done by the stretching. That is, dilatation of the stomach is that state in which the muscularis does not contract back to a normal state when the bloot is relieved.

The symptoms of dilatation vary from a delayed return of the patient's health after an attack of colic lasting several days in the mild case, to the gravest symptoms of fatal shock in the severe one. A bad case of dilatation of the stomach following a severe stomach colic presents all of the symptoms of a rupture of the stomach. There may be free vomiting and the peripheral coldness, cold perspiration, running down pulse rate, empty arteries, labored breathing and tremors about the shoulders and flanks combine to bring about a clinical picture that all practitioners recognize as signs of approaching death.

Treatment: The prevention of dilatations is found in the prompt relief of gastric colics by catheterization. It is also important to avoid a too sudden evacuation of colonic bloot when the stomach is overwhelmed. This is a fine point in the treatment of colics I would like to impress upon my audience. And lastly, the stomach, after having been relieved of its harmful contents, should be refilled with hot water. These recommendations are particularly essential in stomach colics of old horses and in those of some hours' duration.

Weak solutions of aromatic spirits of ammonia instilled into the stomach as a parting treatment is beneficial to the weakened circulation, strychnia subdermally is helpful, and warm clothing, body frictions and sinapisms cannot be overdone.

Overloading of the Rumen: Acute bloat of ruminants is one of the commonest of strictly surgical diseases of animals. It occurs with great frequency in cattle and sheep in this country, and is due usually to the rapid ingestion of gas-forming feeds, such as green clover. The hazard of turning a hungry herd into a clover pasture is well known to all veterinarians and experienced stockmen, but green corn or any green exuberant pasture may cause it. Amongst city cows we find its cause is usually the ingestions of tainted feed, garbage, etc. The disorder may run a rapid course and end fatally in a few hours or take a less acute course and last several days when the formation of gases is not so rapid. In the most acute forms bloated carcasses of animals are sometimes found in the pasture as the first evidence of trouble, and as a rule animals are dead or hopeless before a veterinarian can come to their relief.

In the acute form rumenotomy is the only practical procedure. The trocar and canula thrust into the left flank does not always effect a satisfactory evacuation of the gases because of the semi-solid character of the contents. A large opening made with a scalpel, through and through without ceremony, is justifiable when death from asphyxiation threatens. When the immediate danger is thus despatched, then a more painstaking operation may be performed.

In the milder attacks where the gases are separated from the solid contents, the trocar and the canula afford a relief promptly enough.

(Concluded in November issue.)

DR. CHARLES ALEXANDER KEHR MARRIED.—Dr. Charles A. Kehr, Hopewell Junction, N. Y., graduate of the New York-American Veterinary College, class of 1908, was married on September 24th to Miss Louisa Dorothea Strothoff, of Poughquag, N. Y. After an extended honeymoon the young couple will be at home at Hopewell Junction, where Dr. Kehr has built up a large practice, after November 1st.

DR. D. F. LUCKEY has returned to Columbia, Mo., to the office of State Veterinarian:

IMMUNIZATION TESTS WITH GLANDERS VACCINE.*

BY JOHN R. MOHLER AND ADOLPH EICHHORN, PATHOLOGICAL DIVISION,
B. A. I., DEPARTMENT OF AGRICULTURE.

Among the diseases of horses with which the veterinary authorities are concerned, glanders is probably the most important, and unless strict measures for its control are enforced, the tendency of the disease is to spread more or less rapidly. This fact is due to the character of the disease, to the prevailing methods of caring for horses and, probably more important than all, to the frequent latent existence of the disease in apparently healthy animals. The destruction of all infected animals has been accepted as a matter of course in all civilized countries, and owing to the dangerous character of the disease and the possibility of transmission to man, this action appears to be the sanest and most reasonable procedure in its control. On the other hand, the possibility of a method of immunization of healthy animals is worthy of consideration and would be of a wonderful advantage.

Ever since the discovery of mallein as a diagnostic agent for glanders, experiments have been conducted by various investigators relative to its immunizing and curative value. Many favorable reports have been made by veterinarians of the results obtained. On the contrary, others appear to have had no satisfaction from its use.

Since it has been proven that glanders cases may recover it is rather difficult to establish the value of the immunizing agents as to their action on the disease. Fortunately, we now possess means by which the presence of immune bodies can be demonstrated in the animal upon which attempts at immunization are made. With the serological tests at our command we may con-

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

trol to some extent the action of an immunizing substance and observe how long the immune bodies are present in an animal receiving immunization treatment. It is unfortunate, however, that the demonstration of immune bodies does not indicate the degree of immunity in the animals.

We may obtain in glanders immunization an agglutination value of 1 to 5,000 or over, or a complement fixation with .02 of a c.c. of serum, which may continue for a period of several months, yet this same animal which apparently is supplied with a great amount of immune bodies can be readily infected with glanders bacilli. Thus, in tests undertaken for establishing the degree of immunity against glanders in the horse, it is necessary to expose the injected animals to an infection such as occurs under natural conditions. Observations of such animals as to the clinical appearance of the disease and periodical ophthalmic tests with mallein are the methods by which the most accurate results of the immunization tests can be obtained. Serum tests in these cases are of little value, as they invariably demonstrate immune bodies or anti-bodies in the immunized animals and since even small quantities of mallein injected into a horse are sufficient to produce anti-bodies which remain for 3 or 4 weeks.

Curative results from mallein were reported by Leclainche, Hueppe, Nocard, Johne and Wladimiroff, while its immunizing value against glanders was studied by Schindelka, McFadyean and Semmer, but the results were unsatisfactory. Taking into consideration the bibliography at our command and drawing conclusions from the results obtained it appears that mallein possesses very little immunizing value, and no great benefit can be expected from its use as a curative agent.

Other investigators attempted to immunize horses and other animals against glanders with the use of killed glanders bacilli, and the literature contains some favorable results from this method of immunization. The preparations which were employed for this purpose were in most instances suspensions of glanders bacilli killed by heat. Of the various products which have been prepared and are at the present time used to a limited

extent for the immunization of glanders "Farase," so termed by Levy, Blumenthal and Marxer, gives apparently the best results. It is prepared by killing glanders bacilli with 80 per cent. glycerin or 10 per cent. urea. The bacilli are then dried and the substance is used in that condition for the immunization and does not contain living bacteria. Favorable results were obtained with Farase by Machodin and Bautz and Dediulin. The results of Dediulin are probably the most remarkable, since he reports that on an estate where previous to immunization 276 glandered animals had been destroyed, he injected 303 animals, and after 1 year and 4 months not a single case of glanders developed, although in the meanwhile 14 cases of glanders developed among 300 non-immunized animals.

Machodin and Bautz subjected Farase to various tests to establish its immunizing value. Their results on guinea pigs, cats and horses were very satisfactory. Guinea pigs which were given two injections of Farase resisted six weeks later an intraperitoneal infection with 1/2500 and 1/5000 mg. of glanders bacilli. Of six horses which received two immunizing injections of Farase, two were given 1/2500 mg. of glanders bacilli subcutaneously, two received 1/500 mg. of glanders bacilli per os, and two were exposed with the other animals 45 days after the second injection. For each of the groups one check was used.

Post-mortem examination of the check animals 4 to 5 weeks after the infection showed typical glanders, while the two immunized animals which received subcutaneous injections of glanders bacilli failed to show any lesions of the disease. No record was obtained of the four remaining immunized animals, as they were turned over to another laboratory for study of the duration of immunity in these horses.

*One of the recent works on the immunization of glanders was published by Zurkan who studied the formation of specific anti-bodies in the blood of horses under the action of glanders antigens. He concludes that of various antigens such as Farase, killed glanders bacilli, mallein and malleo-aggressin, Farase and malleo-aggressin proved most active in the production of im-

TABLE
Immunization Tests with Glanders

No. Group.	Guinea Pigs.	Date of First Vaccination. ¹	Amounts Injected. ²			Date of Injection.
1	1	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	10-VI-13
	2	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	17-VI-13
	3	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	24-VI-13
	4	19-V-1913	0.1 c.c.	0.3 c.c.	0.5 c.c.	1-VII-13
2	1	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	10-VI-13
	2	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	17-VI-13
	3	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	24-VI-13
	4	19-V-1913	0.3 c.c.	0.5 c.c.	0.8 c.c.	1-VII-13
3	1	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	10-VI-13
	2	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	17-VI-13
	3	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	24-VI-13
	4	19-V-1913	0.6 c.c.	0.9 c.c.	1.2 c.c.	1-VII-13
4	1	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	10-VI-13
	2	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	17-VI-13
	3	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	24-VI-13
	4	19-V-1913	1. c.c.	1.5 c.c.	2. c.c.	1-VII-13
Checks	1		Not Vaccinated			10-VI-13
Checks	2		Not Vaccinated			17-VI-13
Checks	3		Not Vaccinated			24-VI-13
Checks	4		Not Vaccinated			1-VII

¹The immunizing injections were given at 7 day intervals.

²All injections were made subcutaneously.

³0.5 c.c. of suspension in 10 c.c. or 20 c.c. bouillon containing 1 loopful of surfi

mune bodies. The degree of immunity in the animals was established by Zurkan from the comparative results of the serological reactions he obtained with the complement fixation, agglutination, precipitation and opsonic tests. Since there were no practical tests made on these animals, his statement that malleo-aggressin may be used for the immunization of horses against glanders cannot be accepted as conclusive.

At our last meeting of the A. V. M. A. in Indianapolis, McKellar presented his conclusions on the protective effect of glanders vaccine.

The proportion of infections in the stables where these out-

I.

Vaccine in Guinea Pigs.

Amount of Injection. ³	Date of Death.	Bacteriological Results.
Dilution of Bacilli in 10 c.c. Bouillon	Died 28—VI—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 14—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 28—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 12—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 13—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 16—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 24—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 26—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 5—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 16—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 2—VIII—1913	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 20—VIII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Died 8—VII—1913	B. Mallein recovered.
Dilution of Bacilli in 10 c.c. Bouillon	Killed 28—VI—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Killed 5—VII—1913 on account of extensive supp. abscesses	B. Mallein recovered.
Dilution of Bacilli in 20 c.c. Bouillon	Died 3—VIII—1913	B. Mallein recovered.

ace growth from agar culture.

breaks occurred, as indicated by the agglutination test, is astonishing. As there is no mention made in the article of the time the agglutination tests were applied subsequent to the mallein test, it suggests that the large proportion of reactors to the agglutination test were the results of the mallein injection and not due to the presence of the infection. If this be true, then the effect of the vaccine remains indefinite, and the control of the disease must be accredited to the other precautions which were observed.

At best it will require several years before the value of any method of immunization can be satisfactorily established. The

New York City Board of Health has been conducting immunizing experiments with a vaccine prepared in their laboratory, consisting of a suspension of dried glanders bacilli. Each cubic centimeter of the suspension contains 2 mg. of dried bacilli.

Through the courtesy of Dr. William H. Park, director of the laboratory, a sufficient quantity of such vaccine was obtained for conducting a series of investigations relative to the possibility of conferring immunity to animals injected with this vaccine.

The experiments were made on guinea pigs and on horses. Twenty guinea pigs, about 600 grams in weight, were divided into four groups, four pigs of each group receiving three immunizing injections of a definite amount of vaccine at intervals of one week. The size of the doses and other details are graphically presented in Table I. After the conclusion of these vaccinations one pig from each group was subjected to infection with suspensions of glanders bacilli. These injections with infectious material were administered at various intervals. In all instances the same strain of glanders bacilli was used for the infections.

The fifth pig in each group was not vaccinated, but served as a check, receiving only a corresponding quantity of glanders bacilli. The results of the tests in guinea pigs show that not even an increased resistance was present in the vaccinated guinea pigs. It is to be regretted that in the infection of these pigs probably too large a quantity of glanders bacilli was used. On the other hand, it would appear that if there had been any immunity present in the vaccinated guinea pigs they would have manifested it by a greater resistance against the infection than the check pigs. This, however, was not the case.

In the experiments conducted on horses, 17 animals were used which were purchased on the open market. Most of the animals were aged, but otherwise in fair condition. All horses were subjected to the agglutination, complement fixation and the ophthalmic mallein tests, prior to the vaccination. All of the horses proved free from glanders on all of these tests. Since

the amount of vaccine to be injected for immunizing purposes has not been established, it was deemed advisable to employ varying quantities for the injections in the different horses, and in order to determine the resistance of the animals against infection during and after the vaccination they were subjected to exposure at different times during the investigation.

The smallest amount of the suspension used for the vaccination was the quantity recommended by the New York City Board of Health; viz., 1, 3 and 5 c.c. per injection, while the largest amount any of the horses received was 4, 8 and 12 c.c., respectively. Two of the vaccinated horses received an infection on the nasal mucosa with glanders bacilli, taken up on the end of a platinum loop, one week after the last vaccination. Both of these horses promptly developed glanders and one of them, No. 102, died of an acute form of the disease 21 days after the infection. Thus, there appeared to be no resistance or at least no increased resistance against artificial infection.

To establish the resistance of the vaccinated animals against contact infection a corral was built where all the animals, including two artificially infected glanders cases, were kept. They were fed in common feed boxes and were watered from a common trough. Only one hay rack was used for all animals. Simultaneously with this exposure a stable with three stalls was likewise used for exposing the horses. The construction of the stalls in this stable was such that the animal in the center could reach to the feed boxes of either of the horses in the side stalls. The horse placed in the center was a good, discharging case of clinical glanders, whereas the horses placed in the side stalls were either two immunized animals or two controls, all of which were given one week's exposure with this infected horse. This was accomplished by changing the horses in the two side stalls every week, and bringing in two others from the corral, so as to make the exposure as uniform as possible in all animals, including the checks. The conditions of exposure were apparently severe, yet they did not exceed the exposure which occurs in the stables of large cities, where the sanitary conditions are very poor and where

TABLE
Immunization Tests with Glanders

Horse.	Amounts and Dates of Vaccination.				Date of Exposure.
	1 1 c.c.	2 3 c.c.	3 5 c.c.	4 8 c.c.	
99	28—III—13	4—IV—13	11—IV—13	25—IV—13	16—V—13
107	28—III—13	4—IV—13	.....	.....	.....
86	28—III—13	4—IV—13	11—IV—13	25—IV—13	16—V—13
102	28—III—13	4—IV—13	11—IV—13	.....	{ Infected Apr. 18 with B. Mall.
111	28—III—13	4—IV—13	11—IV—13	.....
110	28—III—13	4—IV—13	11—IV—13	25—IV—13	{ Infected Apr. 18 with B. Mall.
105	28—III—13	4—IV—13	11—IV—13	25—IV—13	
117	2 c.c. 2—V—13	4 c.c. 9—V—13	8 c.c. 16—V—13	.....	16—V—13
118	2—V—13	9—V—13	16—V—13	.....	21—V—13
119	2—V—13	9—V—13	16—V—13	.....	18—V—13
120	2—V—13	9—V—13	16—V—13	.....	21—V—13
123	4 c.c. 20—V—13	8 c.c. 27—V—13	12 c.c. 24—VI—13	.....	20—VI—13
124	20—V—13	27—V—13	24—VI—13	.....	20—VI—13
94	Was not vaccinated			.....	16—V—13
121	Was not vaccinated			.....	20—V—13
82	{ Infected 21—III—13 and used for exposure } to other horses			.....	.....
122	{ Infected 22—V and used for exposure } to other horses			.....	.....

poor light and ventilation afford a splendid opportunity for the propagation of the disease. In fact, the exposure in the corral was rather slight, since the sunlight no doubt had a destructive effect on the infection.

All animals were subjected periodically to clinical examinations, and only one of the vaccinated horses has developed signs of the disease up to the present time, although some of them have been exposed since May 16. Horse No. 99, which received four immunizing injections and was exposed to a discharging case of glanders in the stable, died 15 days after the exposure from acute broncho-pneumonia malleosa.

In order to determine whether any of the vaccinated horses

II.

Vaccine in Horses.

Ophthalmic Tests.		Postmortem.	Remarks.
July 23.	Aug. 23.		
....	....	Acute Gland- ers.	Died May 31, 1913.
....	....	Impaction.	Died April 21, 1913.
—	—	.....	Still under observation.
....	....	Acute Gland- ers.	Died May 9, 1913.
P+++	P++	.....	First clinical symptoms of glanders ap- peared April 23, 1913. Still under observation.
—	—	Showed no le- sions of glanders.	Killed August 20, 1913. No clinical signs of glanders.
P+++	P++	Lungs showed typical gland- ers nodules.	Killed August 20. No clinical signs.
P+++	P++	.....	Still under observation.
—	—	Lungs showed n u m e r o u s glanders no- dules.	Killed August 20, 1913. No clinical signs of glanders.
—	—	.....	Still under observation.
—	—	No lesions of glanders.	Killed August 20, 1913. No clinical signs of glanders.
P+	P+	Lungs showed n u m e r o u s typical gland- ers nodules.	Killed August 20, 1913. No clinical signs of glanders.
P+++	P+++	.....	Still under observation.
P+++	P++	.....	First clinical symptoms of glanders ap- peared March 26, and continued to progress.
P+++	P++	.....	First clinical symptoms of glanders ap- peared May 26, 1913, and continued to progress.

were infected with the latent form of the disease, all were subjected July 23 to the ophthalmic test. This gave surprising results. Two of the vaccinated animals gave a marked reaction (P+++). A similar reaction was also obtained in the affected horses used for exposure, while of the two check animals which were not vaccinated, but had been exposed to a similar extent as the vaccinated animals, only one responded to the eye test; the other check animal failed to give any reaction. One month later all horses in the experiment were again subjected to the ophthalmic test. The results were the same as on the previous test. At this time it was noted that the intensity of the reaction was not as pronounced as in the first test. The inflammation

and amount of purulent discharge were somewhat less than in the previous test. This observation coincides with that of Meyer, who states that after several eye tests in positive cases of glanders the degree of the reaction becomes less distinct.

The detailed account of the results of the immunizing tests in horses is given in Table II.

In order to study the effect of the immunizing injections on the serum tests, the blood of the horses in this experiment was subject to the agglutination and complement-fixation tests from the time of the first injection until the conclusion of the work. It was found that the agglutination value of the serum of the

TA
Serum Reactions in Normal Horses Following

Horse No.		Jan. 31, 3 days.	Feb. 3, 6 days.	Feb. 6, 9 days.	Feb. 9, 12 days.	Feb. 13, 20 days.	Feb. 17, 20 days.	Feb. 23 d.
96	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:500—	1:800	1:800	1:800	1:800	1:500	1:
98	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:800	1:2000	1:1500	3/4+ +	1:2000	1:2000	3/4+ +
102	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:600	1:1000	1:1000	1:1000	1:1000	1:800	1:1
103	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:500—	1:800	1:1000	1:1000	1:800	1:800	3/4+ +
107	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:800	1:100	1:1500	1:1500	1:2000	1:1500	1:1

Horses 96, 98 and 103 Receive a Se

Horse No.		Mar. 31, 3 days.	Apr. 3, 6 days.	Apr. 7, 10 days.	Apr. 10, 13 days.	Apr. 14, 17 days.	Apr. 17, 20 days.	Apr. 24 d.
96	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:500—	1:500—	1:600	1/2+ 1/2+	1:500—	1:500—	1:
98	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:800	1:1500	1:2000	1:2000	1:1500	1:1500	1:1
103	{ Comp. Fix. ....	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1 .2	.1
	{ Agg.	1:600	1/2+ +	1:2000	1:2000	1:2000	1:2000	1:1

Quantities of serum employed in complement-fixation tests 0.1 c.c. and 0.2 c.c.

Fractions represent the approximate degree of fixation as compared with complete fixation; Six dilutions of sera employed in agglutination test; 1:500, 1:600, 1:800, 1:1000, 1:1500 and

vaccinated horses, as a rule, increased from the third day after the first vaccination and continued to rise for a time. A decrease was again noted from 2 to 4 weeks after the last vaccination and appeared practically normal after 6 weeks to 2 months. A complement fixation with the sera of the vaccinated horses was obtained from the seventh to the ninth day after the first vaccination and they continued to give positive fixations from two to three months after the last vaccination.

These serological results appeared only in the animals which gave no reaction to the ophthalmic test, while the blood of those vaccinated horses which gave a positive reaction to the eye test

I.

Subcutaneous Injection of 1 c.c. of Mallein.

Feb. 23, 26 days.	Feb. 27, 30 days.	Mar. 3, 34 days.	Mar. 6, 37 days.	Mar. 10, 41 days.	Mar. 13, 44 days.	Mar. 17, 48 days.	Mar. 21, 52 days.	Mar. 24, 55 days.
$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$
$\frac{.1}{1:2000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:1500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$
$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:600} \frac{.2}{-}$	$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:600} \frac{.2}{-}$	$\frac{.1}{1:600} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$
$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$
$\frac{.1}{1:1000} \frac{.2}{-}$	$\frac{.1}{1:1000} \frac{.2}{-}$	$\frac{.1}{1:1000} \frac{.2}{-}$	$\frac{.1}{1:1000} \frac{.2}{-}$	$\frac{.1}{1:1000} \frac{.2}{-}$	$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:800} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$

Injection of 1 c.c. of Mallein March 28, 1913.

Apr. 24, 27 days.	Apr. 28, 31 days.	May 1, 34 days.	May 5, 38 days.	May 8, 41 days.	May 12, 45 days.	May 15, 48 days.	May 19, 52 days.	May 22, 55 days.	June 2, 67 days.
$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$	$\frac{.1}{1:500} \frac{.2}{-}$
$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$
$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:1000} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:800} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:600} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$	$\frac{.1}{1:500} \frac{.2}{+} \frac{.2}{+}$

indicates slight fixation.

1:2000.

the animals have very little or no immunity against the disease. This is further substantiated also by the agglutination value of the sera returning to the normal level. As a matter of fact, previous investigations carried out by Dr. Buck, of this laboratory, showed that one or two subcutaneous injections of mallein will give a complement fixation which may last from 1 to 2 months. The agglutination value of the serum of such animals is also markedly influenced by subcutaneous malleinization. The serum reaction of horses following the subcutaneous injections of mallein is given in detail in Table III. Thus it seems that a mallein injection has almost the same action on the production of immune bodies in a horse as killed glanders bacilli. Table IV. indicates the results obtained with the agglutination and complement-fixation tests in the animals used in this investigation.

On August 20, two vaccinated horses as well as one check animal, which gave positive results to the eye test, were destroyed, and in all three animals marked pulmonary glanders was observed. Horse No. 105 showed the presence of glanders nodules in the lungs in very great numbers, some of which were of the size of a walnut. In the two other cases, while the nodules were very numerous and from their appearance appeared to be active, they were of smaller sizes ranging from a pin-head to the size of a pea. Horses Nos. 110, 120 and 124 were killed on the same day, although they had failed to show any indication of glanders by the eye test, which was also substantiated by the complement-fixation test with the blood of these animals. Post-mortem examination showed no signs of glanders in these animals.

All the other animals used in these experiments are still under observation, as it is deemed advisable to give them additional exposure, in order to determine whether they possess an immunity to the disease.

The results obtained by these investigations appear to be sufficient to demonstrate the unsatisfactory results of this method of immunization. Of the immunized animals, three contracted the disease from natural exposure, which is a large proportion

when it is considered that all animals were aged and kept most of the time during the exposure out of doors. On the other hand, the fact that of the two check animals only one contracted the disease is additional evidence of the moderate character of the exposure, which further suggests the ineffectiveness of the immunization. In artificial infections of the vaccinated animals they showed no resistance whatsoever, as both vaccinated horses promptly developed an acute form of the disease from touching the Schneiderian membrane with a platinum loop, which has been touched to a growth of glanders bacilli. Thus for the present it seems advisable to abstain from immunizing horses by this method, as a practice of this kind may do more harm than good. Owners having horses which are supposedly immunized would naturally become careless, thinking their animals were resistant to the disease, and thus even a better opportunity would be offered for the propagation of the disease than if the horses were not vaccinated. Furthermore the fact that the blood of vaccinated animals cannot be utilized for serum tests for 2 or 3 months after the injections is also a great disadvantage in the eradication of the disease.

As a result of this preliminary work it appears that the control and eradication of glanders must still be dependent upon the concentration of our efforts in eliminating infected horses and the adoption of proper precautions against the introduction of infected animals into stables free from the disease. By these methods the results achieved in Germany, Austria and Canada have proved very encouraging, and no doubt if executed in the same spirit in this country a marked reduction in the cases of glanders would result.

BIBLIOGRAPHY.

- Leclainche, Etudes sur la malléine.—*Révue vétérinaire*, 1892.
 Hueppe, Ferd.—Einige betrachtungen über die wirkung des malleins. *Berliner tierärztliche wochenschrift*, 1894.
 Nocard, Ed.—Prophylaxie de la morve du cheval. *Recueil de médecine vétérinaire*, tome 74, no. 21, p. 673-689. Nov., 1897.
 ———. Analyse critique des travaux de Schütz sur la morve. *Recueil de médecine vétérinaire*, tome 75, no. 5, p. 186-195. Mar., 1898.
 MacFadyean, J.—The curability of glanders. *Journal of comparative pathology and therapeutics*, vol. 15, no. 1, p. 55-59. Mar., 1900.
 Semmer, E.—Über die gutartige heilbare form des rotzes. *Deutsche zeitschrift für tiermedizin*, bd. 20, 1894.

Levy, E., Blumenthal, F., and Marxer, A.—Über immunisierung gegen die rotzkrankheit. Zeitschrift für infektionskrankheiten, etc., der haustiere, bd. 3, hft. 34, p. 294-312. Nov., 1907.

Bautz, F., and Machedin, S.—Immunisierungsversuche an pferden und anderen tieren gegen rotz nach der methode von Prof. Levy, Dr. Marxer, und Dr. Blumenthal. Berliner tierärztliche wechenschrift, jahrg. 26, no. 12, p. 264-266. Mar., 1910.

Dediulin, A.—Die schutzimpfung von pferden gegen rotz mit abgetöteten rotzbazillen ("Farase"). Zeitschrift für infektionskrankheiten, etc., der haustiere, bd. 9, hft. 6, p. 362-391. July, 1911.

Zurkan, J.—Zur frage der bildung von spezifischen antikörpern im blute von pferden unter der einwirkung von rotzantigenen. Zeitschrift für infektionskrankheiten, etc., der haustiere, bd. 10, hft. 6, p. 473-480. Dec., 1911.

Meyer, K. F.—The conjunctival reaction for glanders (Ophthalmic test). Journal of infectious diseases, vol. 12, no. 2, p. 179-190. Mar., 1913.

MacKellar, R. S.—Glanders vaccine. Proceedings of the American Veterinary Medical Association, 1912, p. 441-445.

VETERINARY COLLEGES COMPLYING WITH REQUIREMENTS OF A. V. M. A., ACCORDING TO COMMITTEE'S REPORT AT 1913 MEETING.

Alabama Polytechnic Institute—College of Vet. Medicine.
Chicago Veterinary College.
Cincinnati Veterinary College.
Colorado State College—Division of Veterinary Medicine.
George Washington University—College of Vet. Medicine.
Grand Rapids Veterinary College.
Indiana Veterinary College.
Iowa State College—Division of Veterinary Medicine.
Kansas City Veterinary College.
Kansas State Agricultural College—Veterinary Department.
McKillop Veterinary College.
Michigan Agricultural College—Dept. of Vet. Medicine.
New York State Vet. College, at New York University, N. Y.
New York State Vet. College, at Cornell University, Ithaca.
Ohio State University—College of Veterinary Medicine.
St. Joseph Vet. Coll. (Beginning with matriculation, 1911.)
San Francisco Veterinary College.
State College of Washington—Veterinary Department.
Terre Haute Veterinary College.
United States College of Veterinary Surgeons.
University of Pennsylvania—School of Veterinary Medicine.

THE REPORT OF THE TWENTY-NINTH SEMI-ANNUAL MEETING OF THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY reached us a few days ago, and gives the details of the meeting briefly reported in the August number of the REVIEW on page 537; and we congratulate Secretary Loblein on his promptness in getting it in the hands of the members of the organization.

THE SCOPE OF ABDOMINAL SURGERY IN ANIMALS.*

BY FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E., LONDON. HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING, AND HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

INTRODUCTION.

Any operation which involves entrance into the abdomen of an animal is, above all others, *the* crucial test of the value of the applicability of antiseptics to surgery. Much more is it the case in an animal patient than in a human being; for the latter can be placed under such perfectly adapted and clean surroundings afterwards that if septic infection does occur it nearly always commences either before or at the time of operation; whereas in our patients we have not only this to think of, but the much greater risk of after infection from the surroundings to which we are compelled, of necessity to return them.

You all know what incomparable advantages our medical *confreres* have when operating, as compared with ourselves. Qualified assistants and nurses to hand, a warm room, or lavishly fitted operating theatre to work in, an expert anaesthetist, a profuse supply of laundry appliances, towels, cloths, etc., hot and cold water supply, a patient amenable to reason and capable of expressing gratitude, and finally a nice clean bed, with night and day attendants to see that no false step is taken which might interfere with a satisfactory sequel. Under such conditions we, too, in veterinary practice, could achieve an equal proportion of successful results, but with animals abdominal surgery must always, I fear, have its limitations. The question of the value of the patient and its practical utility afterwards have generally to be taken into account, as this settles many cases before they

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

come to operation, the shot gun or the choloroform bottle taking the place of the scalpel.

I have now had personal experience of more than 1,000 operations on horses, cattle, dogs and cats, in which it has been necessary to enter the abdomen, and it is mainly in connection with these that I desire to exchange experiences with you to-day. Ovariectomy of the pig I am leaving almost without comment, as the wonderful results in this respect which are obtained by even the common castrator, are too well known to be commented upon. It is sufficient to say that the abdomen of the horse and dog species would not stand the same rough treatment without a very large percentage of mortalities.

I propose to invite an exchange of ideas upon the successes or failures we have had in abdominal surgery under the following headings:

Simple puncture and suturing for accidental wounds.

Simple laparotomy, gut-tie, and reduction of herniæ.

Operations on the stomach and intestines.

Operations on the abdominal urinary organs.

Operations on the internal genital organs.

SIMPLE PUNCTURE.

This operation is performed for ascites, an ailment much more common in the dog and cat than in any other of the domestic animals. In so far as the operation itself is concerned, provided the usual antiseptic precautions are taken, there need be no fear of performing it, but my own experience of a permanent recovery in cases of abdominal dropsy have been very discouraging. In ascites, as a rule, the fluid returns and eventually causes the death of the patient.

Accidental wounds are met with in all animals, particularly the horse and dog, and all of us must have had experience of an abdominal wound with protrusion of intestine. In the pre-antiseptic days the majority of such animals would at once have been put away as painlessly as possible, but experience nowadays shows that such wounds are, in by far the majority of cases, well

worthy of a trial. In the horse quite a large number of observations in which bowel was visible through an abdominal wound and in which parts were sutured even some hours after the infliction of the injury, have been recorded in veterinary literature during the past few years.

LAPAROTOMY GUT-TIE. HERNIA.

Laparotomy may be performed as an exploratory measure with a view to finding out the condition of things in the interior of the abdomen and it is, of necessity, of course the preliminary step to any operation involving attention to the organs inside. It is also useful for the removal of tumors and other diseased conditions.

The hand of the operator may enter the abdomen through the abdominal muscles, through the *linea alba*, up the inguinal canal, or *per vaginam*.

Experience teaches that where it is possible, especially in small animals, the *linea alba* forms the safest and least troublesome site of entrance for an exploratory laparotomy, but at the same time the operator must be guided to some extent by the animal upon which he is working, and the position of the organ he seeks. For example, when seeking for a missing testicle in a cryptorchid horse the inguinal region is, naturally enough, the site chosen for the laparotomy, and one may either dilate the inguinal canal itself or adopt the safer method of breaking through the abdominal muscle alongside of it. Again, in removing the ovaries of vicious mares, one may gain access to them through the flank or the vagina, the latter being, however, generally admitted now to be the safest and best; and in cats experience has taught me that the flank method gives the best results because of the crouching position assumed by this beast when put into a cage. I have known adhesion of the intestine or omentum to the abdominal wall when the wound was made below, whereas with the flank incision the intestines naturally fall away from the wound and are not in direct contact with it for any length of time continuously.

The *linea alba* can be incised almost bloodlessly and the

edges of the wound lend themselves very satisfactorily to the application of sutures and to direct union.

This is not, I believe, the generally accepted opinion, and I recollect well that as a student I was always warned *not* to make my incision there and was given to understand that the wound would not heal readily and that the parts were weak. The exact opposite has, however, been my own experience after a very serious and prolonged trial in which I have incised down the centre of this part several hundreds of times.

The healing of the laparotomy wound gives, as a rule, quite a satisfactory sequel, and it is astonishing how much exploration an abdomen will stand, provided ordinary care is taken when handling the organs and that strict attention has been paid to antiseptic details.

The operation for *gut-tie* in cattle is one which comes under the heading of laparotomy and one which is frequently performed with most gratifying results.

The operation for *hernia* may conveniently be taken under the heading of laparotomy for, practically speaking, the radical operation for this condition is really only a modified laparotomy. Once the organs are returned to the abdominal cavity it needs only a convenient selection of suture methods to keep them there securely. The limitations of abdominal surgery in this condition depend mainly on two things: Some herniæ are inoperable on account of their size and the extent of the adhesions, and others on account of their position. Some ventral herniæ in horses become very large, and for this reason and on account of the risk of prolapse of the gut afterwards, if the animal is at all workable, it is sometimes wise to think twice before advising operation.

Inguinal hernia in the stallion and dog are often difficult to put right if it is desired at the same time to preserve the descended testicle on the same side. If the testis is removed the covered operation does away with a lot of this difficulty.

OPERATIONS ON THE STOMACH AND INTESTINES.

Any operation which involves cutting into the stomach or intestines of an animal is always serious, and the gravity of it

should always be explained beforehand to the owner. Such operations are usually a necessity, and the only alternative to adopt before they are discussed.

It is in regard to the horse that I particularly ask for an exchange of information. In the dog and cat no one will now deny that operations for the removal of foreign bodies from the stomach or intestine are possible, although even in them the proposer must always be guarded; and the ox will bear rumenotomy sufficiently well to make it an operation constantly resorted to by practitioners in country districts; but the exploration, after surgical incision of the stomach and intestine of the horse is as yet very decidedly in the experimental stage. Even the boldest and most enthusiastic surgeon will think twice before he suggests to an owner that the abdomen of a horse shall be opened and the twist of the intestine, which he knows to be present, shall be unravelled, or that the calculus, the position which he may perhaps be able to exactly locate, shall be removed from the intestine by laparotomy and bold incision directly upon it.

Personally, I have within the last few years twice attempted to reduce a twist of the bowel and six times have attempted removal of calculi from the horse. In each the result has been failure. I am disposed to be pessimistic over surgical interference in this animal for these two of its commonest and most painful and fatal ailments. The large bulk and weight of the organs to be manipulated, the necessity for doing it under antiseptic conditions, and the fact of one having to work in a very confined space, render the task an utterly hopeless and impossible one in the case of a twist of the bowel, and indeed the tangle into which a horse's bowel will get is most extraordinary; so much so that it is often quite an impossibility to replace the gut into its normal shape even when the bowels have been removed from the body. I have tried by laparotomy of the flank and, in the mare, *per vaginam*, and I have no hesitation in putting it down amongst the impossibilities of veterinary practice.

Laparotomy for calculus of the bowel, too, must, I fear, be

relegated to the same category, as I do not know of a single recorded case where it has been successfully done. That the healthy, small intestine will stand surgical interference has been demonstrated by several observers, but unluckily it is not in this part where we get intestinal calculi, and I found that the chief cause of failure was to be found in the fact that I was utterly unable in any of the six cases in which I operated to get the large bowel containing the calculus to the orifice of the wound. Calculi are usually lodged in the large intestine, and I have been unable up to the present to find a single recorded observation where any surgeon has been successful in removing, by incision, a stone from this part of the gut. When the stone was in the large colon I found that it was a physical impossibility to withdraw the organ through a wound of safe size for promise of satisfactory suturing afterwards, for one must not forget that the wound one makes has to remain a weak spot with a large weight of bowel pressing upon or against it for some time. The wall of the large colon, too, does not lend itself well to the application of sutures, and the extreme weight of its contents make it apt to readily rupture. The fluidity of its contents, too, make septic infection very easy.

If the stone has passed out of the large colon (and this is usually the case before a stoppage of the bowel takes place), then it becomes jammed in that comparatively narrow lumen which is attached to the lumbar region before actually becoming rectum. Here, again, it is impossible to withdraw the portion of gut so as to bring it into the orifice of a flank wound. I have tried to get at this both by flank incision and *per vaginam*, but, so far, with only failures to report. I believe this, too, to be impossible.

I do, however, believe that there is a future in front, with a prospect of success in a few cases, of the attempt to assist the calculus to move one way or the other, and to get it away from the narrow place in which it is jammed. One horse in which I did this survived for fourteen days and then died of a lung trouble quite unconnected with the original ailment. Especially do I

think so now that one knows the vaginal mucous membrane will stand puncture so well when first rendered surgically clean by antiseptics.

For a stone just a shade smaller in circumference than the bowel I feel sure that with the operator's arm in the abdominal cavity and an assistant manipulating *per rectum* it will be possible to bring the stone away. In the cases in which I tried it the concretions were large and I could not do it, so I contented myself with forcing the stone back again into the large intestine where it had plenty of room to move about and where it must have lain for some months previous to the attack of colic. The relief of the pain was immediate and well marked in each case, although, as I have already observed, none of my patients made permanent recoveries.

Bowel surgery in the horse will always, I fear, have its limitations very strictly defined. It will be a merciful boon to the equine species if someone can devise ways and means to get over the enormous difficulties in this direction.

OPERATIONS UPON THE ABDOMINAL URINARY ORGANS.

Although always to be considered seriously, I do not think we need discuss operation upon all the urinary organs as impracticable or impossible. It is in the horse and dog that surgical interference is most likely to be called for.

No one nowadays will deny the practicability of removal of stones from the bladder, and successful results in both horse and dog have frequently been recorded by numerous observers. Calculi are frequently removed from the bladder of both dog and horse and the proportion of successful results is such that when done by an expert the operation is always worth advising.

When in the kidney the difficulty lies in accurate diagnosis. Operations in the small animals are possible both for removal of stone and for removal of the whole kidney, but in the horse I believe that here again we come to one of our limitations.

OPERATIONS ON THE INTERNAL GENITAL ORGANS.

Here, above all others, may the animal surgeon claim success. The generative organs of the calf, pig and bitch, have been in-

terfered with successfully by the common castrator for many years and in the operations for oophorectomy and ovaro-hysterectomy they are very expert. The mare and cow have also received their share of attention and, provided due precautions are taken with reference to surgical cleanness, the operation for ovariectomy can also be performed upon them with an almost infinitesimal risk.

Provided scrupulous antiseptic care is taken an expert operator may remove the ovaries from the mare, cow, monkey, bitch, sow and cat almost with impunity, and the same may be said in regard to the removal of the male or female generative organs from birds; this operation now being done to quite a large extent in ostriches in South Africa. (Vide Mr. Stanley Elley's article in the *Veterinary Journal* for August of this year). In fact, it is astonishing how little notice the patient will take of this operation afterwards if even ordinary care is exercised throughout the operation and convalescence. The cat is the only one of the above patients about whom I have ever had any anxiety afterwards; cats are curious animals at all times and often refuse to feed on the slightest thing being done to them. Removal of the uterus and ovaries too, is well borne by the bitch, and the cat stands this operation quite as well as the removal of the ovaries alone. With a healthy uterus the risk in the bitch is infinitesimal, either when the ovaries alone are excised or the ovaries and uterus, either when empty or pregnant. Out of the 300 consecutive cases of most of which I have the records I have never lost but one and that was indirectly attributable to other causes and not to the operation.

The pregnant uterus can be removed successfully either before the time due for whelping or even after the act has really commenced. I speak now from an experience of more than 70 cases of this kind, and I have often been astonished at the entire absence of constitutional disturbance, provided septicæmia has not already made progress before the operation is done. Only recently I have had, in consultation with other veterinary surgeons, experience of two typical cases of this kind. One patient had been in labor for two and a half days, and five puppies had been re-

moved by the natural passage, but the sixth was retained and had remained at the top of the left horn of the uterus, this organ being much distended with septic gases. Laparotomy was performed, the whole uterus and contents were excised and the bitch has made an absolutely uninterrupted recovery. The veterinary surgeon with whom I operated in consultation wrote to say that the most noticeable feature she showed afterwards was to grumble because she had no puppies to suckle and to wander round to seek for them.

The second case I alluded to is one of a bitch with her uterus full of pus. This was carefully excised without escape of any of the contents and she, too, has never shown any constitutional disturbance whatever.

As showing, too, how little notice may be taken by an animal when strict asepsis is preserved, I recollect well one case in which a cat had her ovaries removed before her kitten was weaned, and she still continued to satisfactorily suckle it.

Cæsarean Section, in which the uterus is opened and the fœtus removed, is an operation which I dread much more than the entire extirpation of the uterus and ovaries. Recorded observations, however, show that it can be done successfully even in the larger animals and in this connection I would refer you to a case recorded in the *Veterinary Journal* for May, 1906, by Mr. Turtill, in which a dead calf was successfully removed from a three year old heifer and the animal made an excellent recovery afterwards. I attempted it in a little Welsh heifer and succeeded in getting the calf away, but the heifer died on the following day.

Removal of the whole uterus in the mare or cow whilst inside the abdomen is an operation I have never had occasion to attempt nor yet do I recollect reading of its successful performance, but removal of the proalpsed uterus when projecting from the vagina has been done many times successfully in the cow, bitch and cat. The mare, I believe, usually stands this procedure very badly and rarely recovers afterwards.

SUMMARY.

Summarizing the above under the heading of my paper, I think we may truly say that the field of work in the direction of

abdominal surgery in the domesticated animals is quite a practicable and even, one might almost say, a large one. Operations involving the incision of the abdominal wall may be undertaken by every man who has had a veterinary training and the proportion of losses will be infinitesimal.

The internal generative organs bear surgical interference under certain conditions very well indeed, and surgical operations on the bladder, too, are not out of reach.

Operative interference with the interior of the intestine is always a serious matter, although even that should be attempted when no other alternative presents itself. In the smaller animals the chances of success are reasonable; in the large ones the field is much more restricted and has its limitations.

THE ESSENTIALS TO SUCCESS.

Lastly, having decided to operate, let us consider what are the essentials to success. As I said at the commencement of my paper the successful opening and closure of the abdomen is *the* crucial test of the value of the applicability of antiseptics to surgery. For any operation involving this procedure we must have *surgical cleanliness* and to gain this end we must apply ways and means to surgically clean our hands, our instruments, and that portion of the body of our patients which has to be incised.

For the instruments, cotton wool and swabs, there is no simpler or better method than to sterilize by boiling. A clean saucepan can be obtained even at a cottage, and the instruments can be taken direct from that and returned to it whenever they are set down or changed. Or, if preferred, they can be transferred after having been boiled in a solution of some non-corrosive antiseptic.

For the patient the razor must be used to remove the hair, and it will astonish those who have never tried the use of this simple, everyday instrument to see the difference between the healing of the wounds which have had their hair previously removed from the edge by shaving and those in which the precaution has been neglected. And yet, even in these antiseptic days, how few of

us consider the razor as an integral part of the operative outfit and find it a regular place in our operating case. In reality, for those who have once used it, it becomes *the* most used instrument of the whole lot.

The skin is then painted with iodised chloroform or even plain tincture of Iodine, *without being previously washed*, and this is allowed to dry on; the patient then being ready, when anaesthetised, for the incision of the scalpel.

In connection with this use of iodine it is worth while to remark here that this is the only treatment I have adopted for the skin in more than 200 consecutive cases of abdominal surgery, in preference to washing, and that I have never once had reason to regret it. Its value as a cutaneous disinfectant is astonishing, and the saving of time by its use, with the certain knowledge that it will act as desired, makes iodine one of the most useful adjuncts of the surgeon.

For dressing and attention afterwards, I used to always paint with iodoform colloid, but now I give instructions for the daily dressing of the surface surroundings with iodine, and it is a most rare occurrence not to get a primary union; the sutures being removed from five to eight days later.

The hands of the operator should be well scrubbed in hot water with ether soap and a nail brush, and scrupulous care must be taken that the hands do not again come in contact with any surgically unclean body until after the completion of the operation. The operator must not touch anything which has not been sterilized, or if he does he must take measures to again disinfect himself.

In conclusion, gentlemen, I ask each of you, in taking up the discussion, to be good enough to bring forward a few actual cases in which you have interfered with the abdomen. Failures are equally as good to learn from as successes, and one and all will help to swell the list of actual statistics from which results may be drawn to increase that knowledge we are all in search of, viz., the best and safest methods to adopt when called upon to relieve the suffering of the animal world.

APPARENT INCONSISTENCIES OF BIOLOGIC DIAGNOSTICS.*

BY R. A. ARCHIBALD, D.V.S., OAKLAND, CAL.

Many of you, in resorting to the use of biologic diagnostics for the purpose of clearing up obscurities in connection with certain diseases, have, no doubt, occasionally found that the results of such tests have failed to bear out or corroborate your clinical and post-mortem findings. As a consequence, you have undoubtedly been disappointed, and have perhaps lost faith in such tests or in the technique observed in their performance. In other words, the tendency is to assume under such conditions that biologic diagnostic tests are frequently inconsistent and unreliable. For instance, you may take a tuberculous or glanderous individual, one showing suggestive clinical symptoms, and submit him to a biologic test, and you perhaps obtain a negative reaction, not being satisfied with the result of the test, you subsequently apply a second test, and with this test you may obtain a positive reaction. Again, you may test an individual for glanders or tuberculosis with two different biological methods, and you obtain a positive reaction with one test, while the other may prove negative. Under these conditions, it would seem natural or justifiable for you to conclude that the biologic tests applied were inconsistent and unreliable, or that the technique observed in their performance was faulty. The human clinician or therapist can hardly be blamed for losing confidence in the so-called Wassermann test when from five to fifteen per cent. of syphilitic individuals fail to show a reaction at perhaps a stage of the disease when a positive diagnosis is most desirable, unless they understand the reason for such failures. The same is true with

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

other biologics such as the mallein and tuberculin tests as we occasionally are presented with clinical cases of glanders and tuberculosis which fail to react to these agents.

It is our purpose to endeavor to demonstrate to your satisfaction that biologic diagnostics if properly applied are absolutely consistent, but that this consistency depends upon the condition or upon the stage of the disease through which the patient is passing at the time they are applied.

In discussing matters pertaining to biologic diagnostics we do not intend to go deeply into the various and devious ultra-scientific problems incidental thereto, we will simply aim to present the subject in as practical a manner as possible. This procedure is deemed best in view of the great diversity of opinions which exist with reference to the question of biologic reactions. Furthermore, it is not our purpose to prolong discussion along these lines beyond the bounds necessary to a proper and practical presentation of our subject.

In order to facilitate the discussion of this question, we propose to arbitrarily divide the various biologic tests into two classes. First, immune or anergic tests; and second, anaphylactic or allergic tests.

Under the head of immune tests come such reactions as the complement-fixation, agglutination, precipitation, etc. These tests depend upon the determination as to the presence or absence of immune elements in the blood of the individual to be tested.

To illustrate this more fully we will briefly describe the principles involved in some of these tests. In the study of the complement-fixation test, it is necessary to consider three elements whose presence are absolutely essential for bringing about a positive reaction, namely, antigen, amboceptor and complement. The term antigen is applied to any proteid substance that will, when injected into an animal body, give rise to the formation of hypothetical immune substances designated as amboceptors. It would appear that any proteid substance which may be introduced into the animal economy other than by the natural channel (the digestive tract) will give rise to the formation of these immune substances, amboceptors.

The function of the amboceptors, as their name indicates, is to act as a go-between the antigen and the activating substance, the complement, which is a constituent of normal blood. Antigen and amboceptors are more or less specific one for the other, the complement, however, is regarded as being non-specific. The combination of these three elements appears to be a proteolytic one, or in other words, is for the purpose of breaking up the antigenic proteid substance and changing it from complex into simpler forms for the purpose of permitting the nutritive portions to be assimilated, and for the elimination of those portions which can not be used for the purposeful end of the body cell. In fact, it is a process of parenteral digestion going on within the animal body aside from natural or eternal digestion, which takes place normally in the alimentary tract. It must be remembered that in the case of disease producing antigens, the proteolytic action results in the liberation of toxic substances which attack the body cells, causing various pathological changes, the character of which depends upon the selective nature of the specific antigen.

To illustrate, if we should inject a susceptible individual with, say, glanders bacilli, which would in this case represent the antigen, the formation of immune bodies or amboceptors specific for the glanders bacillus would be the result, so that later, if we obtain serum from said individual and add to it glanders bacilli or an extract of same, and complement obtained from the serum of a normal individual, the three substances, antigen, amboceptor and complement, will become anchored or fixed, demonstrating the presence of the amboceptors, the specific substances sought for. It can be readily understood, however, that if the serum is obtained from the inoculated individual at a time when specific amboceptors are not present in the blood serum, that is, when the individual is in an allergic stage, your test would prove negative. In such diseases as syphilis, glanders, tuberculosis, etc., we have reason to believe that there are periods in their course in which amboceptors or immune substances may or may not be present, consequently, if the test be applied during a period

when immune substances are not present, the complement-fixation test will naturally give negative results.

The condition known as immunity undoubtedly may be transient or permanent. When only transient, the power or habit on the part of the tissues or cells to produce immune substances is lost, due to the lack of sufficient stimulation by the products of the infecting agent, and as a consequence the infected individual becomes anaphylactic. This is particularly true of such diseases as tuberculosis, glanders, syphilis and other chronic infections. In these diseases, when the infecting organisms become walled off from the normal tissue, or become encapsulated, there is no destruction of bacterial cells, no liberation of endotoxic elements, no stimulation, and as a consequence immune bodies cease to be formed and disappear from the blood stream through the natural channels of elimination.

Agglutination and precipitation reactions depend upon the presence of immune substances which receive the name of agglutinins and precipitins respectively. These substances, while perhaps differing in some respects from amboceptors, still are so intimately related that it is almost impossible to separate them, and it is generally believed that they exist in an animal undergoing immunity at the same time, therefore any statement made with reference to amboceptors will also apply in a general way to these substances, consequently nothing more will be said regarding these tests at the present time.

Under the head of anaphylactic, or allergic reactions, come such tests as the mallein test for glanders, the tuberculin test for tuberculosis, the lutein test for syphilis, the Irons' test for gonococcus infection, etc. These tests are dependent upon the fact that the infected individual has become allergic or hypersensitive to the toxin of the specific infection to such an extent that when the specific toxin is brought in contact with the tissues or cells of the infected individual, injury to such tissues or cells is the result. This injury interferes with the functional activity of such tissues or cells or perhaps destroys them entirely, giving rise to the clinical manifestations that indicate a positive reaction. It matters

not whether the toxin is applied locally, as in the case of the ophthalmic or cuto tests, or as in the case of the subcutaneous test, the results are essentially the same, providing the individual is in an allergic condition.

Care must be used in interpreting skin reactions, however, as the skin has not only a marked affinity for foreign protein substances, but also reacts in a striking manner to various split products, and the intensity of such reactions may lead us to reach wrong conclusions as to the extent and progress of the existing pathological changes.

From our knowledge of the mallein or tuberculin tests, we know that there are occasions when an infected individual will fail to give a positive reaction, yet this fact cannot detract from the efficacy of these tests. The failure to react is simply an indication that the condition of the individual at the time the negative anaphylactic reaction is obtained is one of immunity and not one of anaphylaxis. It can also be readily understood that an infected individual may be in an allergic and in an immune condition at one and the same time. In fact, this condition is rather the rule than the exception, but it is occasionally true that only one of these conditions may exist, more especially in such chronic conditions as tuberculosis, glanders, syphilis, etc., during certain stages of their course.

It is believed that the tissues or cells of susceptible individuals do not normally possess specific affinity for toxic substances, but acquire them by association with specific infections and their toxic elements. This specific receptivity is the result of the stimulating action by specific toxins, and constitutes the stage of anaphylaxis or allergy, a condition that is present when the clinical symptoms of a disease are first manifested.

It would seem as if the symptoms of a disease arise when amboceptor becomes concentrated sufficiently to break up the infecting organism or, in other words, when specific proteolysis begins.

The general conception of the present time is that on sensitization, immunization with protein substances, elements of the

general nature of amboceptors are formed. These are specific and their union with antigen in co-operation with complement results in the liberation of toxic substances that produce the anaphylactic symptoms and lesions and this action is regarded as one of parenteral proteid digestion.

From what has already been said it is easy to realize that while an infected individual is not in a stage of immunity such tests as the complement-fixation, agglutination or precipitation will fail to give positive results, and the same is also true that when an individual is not in an allergic or anaphylactic stage, he will not react to such tests as the mallein or tuberculin. It is a well-known fact that if we attempt to test a second time a glandered or tuberculous individual with mallein or tuberculin, before a sufficient time has elapsed following the first injection, we fail to obtain any reaction, for the reason that the first injection of toxin has produced as the result of stimulation of the body cells a condition of temporary immunity or, as sometimes referred to, a condition of anergy or anti-anaphylaxis.

Whether this refractoriness to tuberculin and mallein that develops in certain cases of tuberculosis and glanders is truly anergic is not definitely known, but it is quite evident that refractoriness may be induced by a large dose of antigen in the latter stages of incubation, nevertheless, it is a fact that the tuberculin or mallein reactions, while best developed in true tuberculosis or glanders are also obtainable by sensitization with mallein or tuberculo-proteins. Does it not seem reasonable therefore that similar conditions may naturally prevail during the course of such chronic conditions as glanders, tuberculosis or syphilis?

The study of such a disease as typhoid, which ordinarily follows a definite course, teaches us that at certain stages of the disease the application of an anaphylactic test will give positive results, while during the same stage an immune test will give negative results. It has also been taught us that a certain time must elapse subsequent to the appearance of clinical evidence of this disease before an immune test will prove efficacious. The inference from all this is to the effect that notwithstanding the

fact that you may have, for instance, a Wassermann performed on a syphilized patient to-day with negative findings, and another test applied a month or so from now with positive results, it does not mean that the laboratory technique is in error or that the test is at fault. It simply implies that at the time of the first test this patient was in an allergic condition, and subsequently became an anti-anaphylactic by acquiring immune substances in his blood.

An interesting feature of anaphylaxis and immune phenomena lies in the fact that hypersensitiveness to a foreign protein develops only when a certain period of cessation of the introduction of the substances is allowed to elapse before the next injection, which then produces the well-known symptoms. Thus continuation of inoculations at regular short intervals does not necessarily confer on the recipient of the foreign substances anaphylaxis during that period. It is, therefore, more likely to develop an anaphylactic condition in those patients who are infected with certain organisms which remain in the body for a long period of time, during which time their activity undergoes fluctuation owing to the production of certain antagonistic substances by the infected host.

The clinical course of syphilis, glanders or tuberculosis fulfil all the requirements that lead to the development of either immune or allergic conditions.

Due to lack of time, we have refrained from going into the technique of the various tests, but we wish to state that if there is any one present who desires to go into that phase of the problem, we shall be pleased to answer to the best of our ability any questions that may be propounded.

This brings us to the last and, perhaps from your point of view, the most important point of all, viz: "How the apparent inconsistencies of biologic diagnostics may be overcome."

In such a disease as glanders the problem is, comparatively speaking, easy of solution. To eliminate error in the case of such a condition as glanders it simply becomes necessary to apply simultaneously both an anaphylactic and an immune test. In

this way you are almost certain of obtaining positive results, no matter in what stage of the disease your individual may be. In view of the recent achievement of Hideyo Noguchi in successfully cultivating the spirochæta pallida, we are hoping to be able to make a positive diagnosis in any stage of syphilis. By cultivating the spirochæta pallida Noguchi has accomplished that which will probably enable the laboratorian to use a specific antigen in the performance of the complement fixation test, and will also enable the clinician to apply at the same time an anaphylactic test in the form of an extract of said organisms.

As regards biologic diagnostic tests for tuberculosis, we shall still have to pin our faith upon allergic tests for the reason that up to the present time no practical method has been evolved for determining the presence or absence of immune elements in that disease. Many laboratorians, however, are working along these lines, and it is to be sincerely hoped that the day is not far distant when a practical immune test for tuberculosis and many other obscure diseases will be found. When that day comes many of the terrors and uncertainties regarding this and other diseases that run a variable and more or less indefinite course will have been dispelled.

WEBSTER'S DICTIONARY COULD NOT SAVE LAWBREAKER.—*The Nebraska Daily Press*, of Nebraska City, recites a case of a man being tried for violating the practice act of the state of Nebraska by assuming a veterinary title and practising illegally. The defendant's attorney made a demur against the charges preferred on the ground that according to his interpretation of Webster's definition the words "Veterinary Surgeon" or "Veterinary" were not the title or analogous title referred to in the law. This was sustained by the judge. The same charges were later taken before another judge, where the same attempt to juggle with the interpretation was made, but unsuccessfully, the judge deciding that the defendant had violated the law by assuming a title to which he had no right. He then pleaded guilty, his fine and costs amounting to \$81.00.

AN IMPROVED METHOD OF MOUNTING MUSEUM SPECIMENS.*

BY L. ENOS DAY, V.S., VETERINARY INSPECTOR; IN CHARGE OF THE BRANCH PATHOLOGICAL LABORATORY, BUREAU OF ANIMAL INDUSTRY, AT CHICAGO, ILL.

From the time that pathology was first established as a science, teachers and workers in this branch of medical science have endeavored to preserve the tissue so that the pathological changes could be demonstrated in the gross specimen. In order that the specimen may be of greatest value, the color, as well as the structure, should be preserved, as much depends upon the color in demonstrating macroscopical pathological changes. The method which preserves the color best without destroying the structure of the tissue is the one desired.

Alcohol of various strengths is probably the oldest substance used in preserving museum specimens. Its use, however, has the great disadvantage of not only shrinking the tissue but rapidly destroys the color. Some years ago we welcomed with delight the statement that formalin would meet our desires as a preservative for museum specimens. The results, as we all well know, did not meet with our wishes. While it is true that it prevents decomposition even in quite dilute solutions, it does not preserve the color and causes some shrinking and renders the tissues quite brittle, when used alone. It has, however, the advantage of being much cheaper than alcohol.

It was not until Professor Kaiserling published his method of preserving museum specimens that we were able to preserve the original color in pathological or normal tissue for any length of time. At the present time I know of no method which preserves the color and structure better than this one. Since this

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

method was first published, a number of modifications have been recommended, but none of them have proven to be any special improvement over the original formula. This method has the disadvantage of being bulky, the specimens having to be placed in glass jars of various sizes which are unwieldy and awkward to handle, especially in classrooms, and occupy a great deal of space in the museum.

As the specimens become old, or if exposed to the light, they soon lose their bright color. Various molds often grow in the final preserving fluid and destroy the specimen in that way. If one wishes to ship them elsewhere for exhibition purposes there is always the great danger of breaking.

In order to overcome these objections several workers have mounted museum specimens in "Kaiserling jelly" in Petri dishes cemented to plate glass squares, the "Kaiserling jelly" being made by adding from 10 to 18 per cent. of the best grade gelatin to the Kaiserling preserving fluid, which will be referred to later.

The pioneer and probably the most successful workers with this method in this country are Watters,(1) Coplin,(2) Albert,(3) Watters.(4) Specimens mounted in this manner are easy to handle, stand shipping well and occupy but little space. They have this disadvantage, however, that the gelatin is not a clear white and becomes darker with age, and is liable to shrink either from the glass or the specimen. This, of course, detracts very materially from the appearance of the specimen.

About fifteen or twenty years ago a method for mounting museum specimens in Kaiserling's fluid between watch glasses and plain glass squares was perfected in Germany. This method has been kept a profound secret by those who perfected it. These preparations are bound in a cardboard frame covered with book-cloth, and are very neat in appearance and durable. Several years ago the writer had the pleasure of examining some of the German specimens and also some that had been prepared in Kaiserling jelly, and was at once impressed with the beautiful appearance of the former as they contained no air bubbles and

the fluid was clear and contained no color; also that the cardboard case protected the glass background from being soiled when handled. I began at once experimenting in various ways to prepare mounts in Kaiserling fluid, as it appeared to me that it was much superior to any of the various other fluids. After many attempts, I succeeded in mounting specimens under watch glasses in Kaiserling fluid. These mounts retain their color and show relations well, are easy to handle and occupy a very small amount of space, and are permanent. The greatest difficulty experienced was to find an adhesive substance that would seal the watch glass to the glass square which possessed sufficient elasticity to compensate for the expansion of the fluid during extreme changes of temperature without cracking and allowing some of the fluid to escape. Asphaltum with a melting point of about 230 degrees F. was found to meet the above requirements. I have placed mounts cemented with this substance in an incubator at a temperature of 104 degrees F. for forty-eight hours and then exposed the same mounts to a temperature as low as 5 degrees below the freezing point for twelve hours without any undesired effects.

The method which I have adopted is as follows: The tissues selected for museum mounts are washed lightly in water to remove any blood or foreign matter that might adhere to them. If the specimen is a thick mass it is cut in slices about an inch in thickness and placed in Kaiserling's fluid No. 1 until fixed through, which requires from one to several days, depending upon the size of the tissue and the amount of fluid used. It is best to use plenty of fluid. Care should be taken to place the specimen in the position that it is to assume when mounted. If this is neglected it is liable to become wrinkled and curled and can never be made to look well afterwards. If it is desired to mount thin membranes, such as pleura, mesentery, peritoneum, etc., they should be stretched over glass frames before fixing in order to prevent curling. Either glass or glazed earth earthenware jars should be used for fixing containers, as metal is liable to cause staining. As soon as the tissues are fixed through, they

are washed in running water for fifteen or twenty minutes to remove as much of the formalin as possible from the surface. They are then trimmed down to the desired size and shape to fit into the watch glass, and placed in 60 per cent. alcohol until the color begins to return, then they are placed in 95 per cent. alcohol until the color is fully restored. This step must be watched closely, for if they remain too long in alcohol they fade again. As soon as the color is properly restored they are placed in Kaiserling's preserving fluid for a day or two and then mounted. It is always desirable to mount the specimens within a few days after fixing in order to get the best results. Before mounting, the tissues are exposed to a negative pressure of about 26 inches of mercury for from half an hour to an hour and a half to remove all of the alcohol. If this is not done the alcohol which remains in the tissues produces fading.

Before using the watch glasses it is necessary to grind them perfectly level. This is done by sprinkling fine carborundum powder on a large piece of plate glass and then pouring a sufficient quantity of water on the powder to make it grind well. The grinding should be continued until the ground surface nearly equals the thickness of the glass. Watch glasses 6 inches in diameter are a very good size, but larger or smaller ones may be used, depending on the size of the specimen one wishes to mount. The glass squares should be made of plate glass $3/32$ of an inch thick and $7\frac{7}{8}$ inches square for the 6-inch watch glasses. The size of the square glasses should vary in proportion to the size of the watch glasses if larger or smaller ones are used. Plate glass squares thicker than $1/4$ of an inch are undesirable even for very large specimens requiring watch glasses $7\frac{1}{2}$ inches in diameter. After the glasses are thoroughly cleaned, the specimen to be mounted is placed in the watch glass and covered with a glass square allowing the watch glass to protrude far enough to form a lip. The fluid (Kaiserling's preserving fluid) is poured in at this opening until it runs over, then the watch glass is slipped towards the centre sufficiently to close the opening and then set aside in a perpendicular

plane to allow the air bubbles, if present, to rise, and then the process is repeated until no more bubbles rise, then moved to the centre. If a number of mounts are to be made, the specimen and glasses may be immersed in a large quantity of fluid and put in place and taken out and set aside as before. If the watch glasses have been properly ground the glasses adhere so perfectly that the fluid does not escape. After all of the bubbles have been removed, the mount is placed on a flat surface with the watch glass upwards and all moisture and greasy substances are carefully removed; then melted asphaltum which has been heated to about 250 degrees F. is poured around the joint between the two glasses. The amount of asphaltum should be liberal and should extend about $\frac{1}{2}$ inch upon the watch glass and an equal distance on the plate glass. After the asphaltum has become cool and set, it can be trimmed with a knife and the surface smoothed down with a thick-bladed knife or other metal which has been heated to nearly a red heat. After the melted surface has again become cool the mounts are set aside for a few days to determine if they have been perfectly prepared. If bubbles appear the specimen should be remounted, which is not a difficult task. The greater portion of asphaltum can be removed with a knife and the remainder with xylol or gasoline, as it is very soluble in either of these fluids. If the specimen has remained perfect it can now be enclosed in the cardboard mounting. When $7\frac{7}{8}$ -inch glass squares and 6-inch watch glasses are used the cardboards should be 8 inches square with a circular opening $5\frac{3}{8}$ inches in diameter in the centre. They should be about $\frac{1}{16}$ of an inch thick and of good quality. The upper board should be covered on the top side with bookbinders' cloth and on the under side it should have a piece of cardboard of the same size and thickness with a circular opening 7 inches in diameter glued to it, thus allowing space for the asphaltum. The cloth should extend about an inch on all sides, allowing sufficient material to paste to the ends and under side. The lower board should be just 8 inches square with an opening the same size as the upper and covered with cloth in the same

manner, only that the cloth does not project over the ends. A good quality of glue should be used to fasten the top and bottom cardboard securely to the glass and also for holding the cloth over the ends and to the bottom board.

Nearly all text-books pertaining to pathological technic give the formula for Kaiserling's fluids, but for the benefit of those who do not possess such a work I will give the formula, which is as follows:

No. 1—Kaiserling's Fixing Fluid:

Nitrate of Potash.....	15 gms.
Acetate of Potash.....	30 gms.
Formalin	200 c.c.
Water	1,000 c.c.

(Alcohol, as stated before; to restore the color.)

No. 2—Kaiserling's Preserving Fluid:

Acetate of Potash.....	100 gms.
Glycerin	200 gms.
Water	1,000 c.c.

The preserving fluid should be boiled for five or six minutes before using and allowed to cool to about 80 degrees F. This answers the double purpose of destroying mold spores and of driving off the most of the absorbed and imprisoned air in the fluid, thereby lessening the danger of bubble formation and subsequent growths of molds.

REFERENCE.

- (1) Watters, New York Medical Journal, August 23, 1902; Vol. 76, p. 318.
- (2) Coplin, Journal of the American Medical Association; August 13, 1904; Vol. 43, p. 441.
- (3) Albert, Journal of the American Medical Association; June 30, 1906; Vol. 46, p. 1993.
- (4) Watters, Medical Record; December 22, 1906; Vol. 70, p. 988.

FROM OHIO TO GEORGIA.—Dr. Chas. A. Klein, formerly of Cincinnati, Ohio, has been transferred by the B. A. I. service to Augusta, Georgia. The REVIEW wishes the doctor happiness in his new home.

DR. RIETZ JOINS THE HAWKEYES.—Dr. J. H. Rietz, Pittsburg, Pa., has gone to Ames, Iowa.

A RESUME ON THE CONTROL AND ERADICATION OF GLANDERS.*

BY DR. H. D. GILL, DIRECTING THE WORK FOR THE COMMISSIONER OF AGRICULTURE IN THE CITY OF NEW YORK.

SYLLABUS.

1. *Official concentrated control:* Experience has shown that the best work can only be done under official jurisdiction. Ofttimes local veterinarians have been swayed in the rigid enforcement of laws, regulations and rules, through the interference of their general practice, disposition, temerity, insufficient pay for service, personal suasion and undue influence. The effect of such control on the horse-owning public would be advantageous.

2. *State or city quarantine:* The importance of this is obvious.

3. *Tagging, branding or marking for positive or permanent identification:* The many cases of similarity in the general description of horses makes a more positive mark of identification indispensable.

Experience and careful consideration suggests the use of a small band ear tag in preference to other. Tagging has many advantages in sanitary police work, and also protects the general horse-buying public. Horse owners, enlightened by diagnostic tests, spread glanders through their indiscriminate disposition of reacting animals, while if these were marked, such cases could be checked and traced back to the source of infection.

4. *Control of all diagnostic tests for glanders and the use*

* Presented at the request of the Special Committee for the Detection of Glanders of the American Veterinary Medical Association, at its fiftieth anniversary meeting in New York, September 1-5, 1913.

or application of any agent or substance that would counteract or interfere with correct results of sera or mallein tests: The indiscriminate use of such tests are in the main the cause of the present prevalence of glanders in this city.

The method for all tests and the agents used should be standardized. Mallein should be refined, thus eliminating agents that might, through their irritating effects, cause thermic disturbances, giving false and misleading results. Mallein should be put up and kept in the best way to maintain its potency and keep the same from deterioration or contamination.

The ideal way would be for laboratory control and delivery for immediate use.

5. *Licensing all places where horses and mules are stabled, kept, shod, fed or watered:* This would be of incalculable value to the police sanitary work. The disinfection could be properly carried out; bad sanitation and hygiene could be corrected; stables quarantined and closed until adequate repairs or improvements could be made.

6. *Control and disposal of glandered horses:* All clinical or physical cases should be killed on sight. Such horses being of no value, except for offal, no indemnity should be paid by the state. All animals giving a positive reaction to at least two of the several accepted tests, should be considered glandered and destroyed as such. To facilitate good work it would be well to pay a liberal indemnity for the latter cases. No clinical cases should be kept for treatment or experimental purposes except under state control and in such place and under such conditions as the Commissioner of Agriculture shall designate.

7. *Post mortems should be made on all horses dying within the city limits:* This would check horses surreptitiously disposed of and through pathological investigation corroborate tests and other diagnoses. This would also be valuable for complete and correct statistics.

8. *Practical method for promptly eradicating glanders from among horses in stables and ultimately in the city and state:* Kill and post clinical cases. Make two blood tests, one comple-

ment fixation, one agglutination, of all the other horses in the stable, checking the same with a mallein eye test. Horses giving positive response to all three tests should be considered glandered and destroyed.

The use of subcutaneous injection of mallein should be discouraged. Such injections counteract and interfere with correct results of subsequent sera tests, which are found to be uncertain and misleading where mallein or vaccine has previously been injected.

Uncertain mallein tests have often been the cause of embarrassing delays, controversies and expense. With the tagging of all horses tested, work along these lines will be more satisfactory, the records and statistics more accurate, and valuable data would then be available.

THE FIFTIETH ANNIVERSARY OF THE FIRST INTERNATIONAL VETERINARY CONGRESS is to meet in London during the coming summer. A special effort is being made to furnish a program replete with the best in possession of the veterinary profession and make it a fitting semi-centennial of fifty years of progress. American veterinarians should make every possible effort to attend this meeting. It is very probable that the American Veterinary Medical Association will not hold its regular annual meeting in September, as has been the custom the past few years, but it will probably meet in New Orleans during the week of the holidays. This will give the members an especial opportunity for attending both meetings.

All who attend the international congress from this country will have a special opportunity for visiting Continental Europe at a minimum additional expense by joining the touring party under the able direction of Dr. Eichhorn. Many opportunities will be afforded a party of this kind that could not be gotten individually. It should be the rare treat of a lifetime. Those who anticipate making the trip should notify Dr. Eichhorn as soon as possible so that complete details can be worked out at an early date.

You are especially urged to join the party and participate in the rare treat that is in store for those who are going with this party, which will end its study and pleasure tour by attending the International Veterinary Congress.

(Signed) C. J. MARSHALL,
President, American Veterinary Medical Association.

REPORTS OF CASES.

CEREBRO-SPINAL MENINGITIS OF THE HORSE.*

By B. F. KAUPP, in Charge Field Laboratory Investigation, Holly, Colo.

HISTORICAL.

Hutyra and Marek in their English edition of Pathology and Therapeutics of Diseases of Domestic Animals say:

"Epizootic cerebro-spinal meningitis of the domestic animals is an independent infectious disease characterized by inflammation of the membranes of the brain and spinal cord and the adjacent nerve tissue. In certain districts the disease is enzootic and even tends to be epizootic."

"In 1896 Siedamgrotzky, Schlegel and Johne simultaneously carried out extensive bacteriological and pathological investigations as to the nature of the disease. Further researches were made by Ostertag in Germany in 1900 and in America by Wilson and Brimhall in 1898 to 1903, making a clinical bacteriological as well as pathological study. Investigations were also made by Streit in 1902, Harrison in 1905 and Christian in the same year." "Histological investigations which were made by Dexler in 1900 and more recently by Oppenheim in 1907, have furnished proof that cerebro-spinal meningitis or Borna disease is an inflammatory one."

"Siedamgrotzky and Schlegel found a micrococcus and more rarely a diplococcus in the subarachnoid fluid. This organism formed a dirty white, sharply circumscribed colony on the surface of gelatin. Intravenous inoculations with cultures into horses in one case produced no effect, in a second there were symptoms and slight brain disturbance and the micrococcus was demonstrated in the cerebro-spinal fluid, a third injection was followed by symptoms of sleepy staggers. Subdural inoculations into

* Presented to the fifteenth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

[Note]—As this article includes a clinical study and postmortem findings on a large number of cases, we have placed it under "Reports of Cases"; although it is also in every sense an original article.—Ed.

horses caused severe meningo-encephalitis, the cocci being demonstrated in pure culture in the exudate."

"Johne found diplococci in the cerebro-spinal fluid and in one case in the blood of diseased horses. Some were free, some were included within the cells.

"The cultural characteristics resembled those of Siedamgrotzky and Schlegel organism and short chains were formed. This organism was called by Johne *diplococcus intracellularis equi*. Typical symptoms of Borna disease followed the subdural inoculations of the organism into two goats and three horses. All the horses recovered while the goats died."

"Similar diplococci were found by Marcq in diseased horses in Belgium."

Organisms morphologically resembling the diplococci of Johne were found by Ostertag in cases of Borna disease. They were present as a rule in the subdural and ventricular fluid of the brain and occasionally in the blood, liver and urine.

"The organism designated by Ostertag as Borna streptococcus was pathogenic for the horse and cattle. Pigs did not contract the disease."

"Streit isolated an organism closely resembling and possibly identical with the streptococcus of Borna disease from a case of epizootic cerebro-spinal meningitis in a horse in Ontario, as did also Grimm in southern Germany."

"Christian found an exactly similar organism in primary sporadic meningitis in the horse."

HISTORY OF THE RECENT OUTBREAK OF CEREBRO-SPINAL MENINGITIS IN THE MIDDLE WEST.

On July 20, 1912, an apparent infectious disease was observed among horses some 10 miles north of Dodge City, Kansas. This disease spread for a radius of several miles, extending over the major portion of Kansas and Nebraska, where the greatest loss occurred, and later invading particularly northern Oklahoma and eastern Colorado. For the most part no restriction was placed on intra- or inter-state shipment of horses from or in the infected district. So far as the writer knows no definite data as to actual loss was kept but it has been variously estimated that from 20,000 to 30,000 horses were lost from this outbreak. There were very few mules that contracted the disease.

The disease spread to the eastern tier of counties of Colorado about the first of September. Dr. George H. Glover, chairman of the Division of Veterinary Medicine and of the Veterinary

Section of the Experiment Station, made a trip to the infected district and a brief field investigation was made. The station authorities then decided to establish a field laboratory at Holly, Colorado. This laboratory was supported by funds appropriated by the five counties, namely: Prowers, Crowley, Bent, Otero and Pueblo.

Appearance of the Disease in Colorado: An immigrant came to Hartman, one center of the disease in Colorado, just nine days before the first case appeared in that locality. The man had a horse sick of the disease at that time, and after staying a time around the alfalfa mills went four miles west and camped. Later, the sick horse died.

At the second center, where the disease appeared, an immigrant came and camped on the premises just eight days before the first case appeared on that place. The immigrant had a horse sick of the disease. The horse later died. Prior to these two incidents an immigrant came to Granada with a horse sick of the disease. The horse died. No animals came down with the disease at this locality till about four weeks later.

Climatic Conditions: The stricken district in Colorado lays approximately 4,000 feet high and in the dry country. The pastures in the bottoms consist of slough grass, salt grass, with blue stem, buffalo grass and gamma grass. These grasses grow sparingly over the pastures and do not form a matted bunchy condition. The pastures soon become dry after showers.

A study of the weather records at the weather bureau at Ft. Collins shows that more rain fell in Northern Colorado, where the disease did not exist, than in the eastern and southeastern parts stricken with the disease. A study of the records of the stricken district for ten years back shows a greater rain fall in two other years.

On the night of August the 13th there was a heavy precipitation, which caused the Arkansas river to overflow. There was only one shower after that time and that fell the last week in August. There was no rain fall in that district from that time till November.

In the district stricken by the plague there was only one light frost, and no frost heavy enough to kill the sugar beet tops till after the third week in October.

The greatest loss of horses in Prowers county was between September 15th and October 1st.

Feed and Water: Some horses were fed cured cane, some second-cutting alfalfa. The majority were at times on pasture.

The ranchmen of Colorado do not feed their first-cutting alfalfa at this season of the year and it was with some difficulty that we secured some for our experimental animals.

The water supply on the premises where the disease appeared in some instances was from wells varying in depth up to 800 feet. In others from irrigation ditches.

Some of the animals were kept up the entire summer for routine ranch work and fed wholly on dry feed.

Mortality: Our records show that there was 1838 horses in the stricken district investigated. Of these 154 contracted the disease and 30 died.

The horses that grazed on the river bottoms overflowed by the August flood did not come down with the disease. A very few were on salt grass pasture. The most were on high gravelly ground north and a few south of the river. The principal loss was around the towns of Hartman, Amity and Bristol. These pastures were high, dry and gravelly.

Horses of all ages, breed and sex were affected. Dr. Glover observed a case in a suckling colt and others in livery horses on dry feed and constant livery service. Work horses in the field and in the pasture were affected alike.

Clinical Study and Post Mortem Findings: In our investigation work we made it a rule to study only typical clinical cases. At death a careful autopsy was held, specimens secured for laboratory study; this included affected tissues, urine, brain and spinal fluids. The brain and spinal fluids were drawn under strict sterile laboratory methods.

A few selected typical case records will be given to better show conditions found.

CASE No. 2—History: Black mare, 8 years old. Went down two hours after taking ill and died in about 12 hours. Has been on native pasture. The source of water was from an irrigation ditch.

Symptoms: At the time seen the temperature was 104.8 degrees Fahr. Pulse 58 and full. The respiration is slightly accelerated. The reflexes are absent. When pricked with a pin from head to foot and from head to tail she does not flinch. There are a few erosions on the mucous membranes of the lips. The tongue is coated with a whitish, fuzzy, slimy material. The first heart sound is prolonged. Nearly falls when pushed, showing great prostration. The animal is stupid. The head is turned to the right side. She refuses to move when urged to do so. Later the animal goes down showing spasms of the entire musculature.

There is a slight rumbling of the bowels. The tail is paralyzed. There is difficulty in swallowing. The lower lip hangs pendulous. There is partial facial paralysis. There is a peculiar tossing of the head. The ears are perpendicular and occasionally spasmodic movements are noted. There is ptosis present. The animal braces itself, finally goes down and after several hours in a comatosed state dies.

Autopsy: The brain is congested. This congestion extends into the cord. There is hyperemia of the epiglottis, pharynx, vocal cords and trachea. Both kidneys show active and passive congestion and cloudy swelling. Perineal edema is present. The liver is enlarged and shows congestion and cloudy swelling. The heart shows slight congestion of the vessels of the musculature. There is a verminous aneurism of the great mesenteric artery due to larval strongiles. There is a catarrhal inflammation of the stomach and entire intestinal tract. There is a catarrhal inflammation of the bladder with a precipitation of considerable calcium carbonate. The marrow of the long bones is very dark, areas showing hemorrhage, still other parts showing congestion.

CASE No 3—History: Gray gelding, 13 years old. Has been sick 32 hours. This animal's feed consists of cured cane. The water was from a shallow well.

Symptoms: The head is turned to one side. The temperature is 105 degrees Fahr. The respiration and pulse is accelerated. The animal is weak with wabby gait and nearly falls down when pushed. The reflexes are partially absent. There is grinding of the teeth. There is a bracing attitude, the legs being placed wide apart. Perspiration appears in spots over the body. The step is rather high as if not able to judge the step. The animal is up and down. There is a tossing of the head and the ears are held erect. There is a quivering of the muscles and difficult swallowing. The pupils are normal. The animal rests its head in the corner. An analysis of the urine shows the following: Specific gravity 1.022. There is no sugar. There is no albumin. The animal is finally unable to stand, goes down, comatosed, and after several hours dies.

Autopsy: The tongue is coated with a fuzzy, slimy whitish material. There is hyperemia of the pharynx, larynx and trachea. There is a catarrhal inflammation of the gastro-intestinal tract with small hemorrhages (sugillations) (stomach, small and large intestines, floating colon and rectum). There is a catarrhal inflammation of the bladder with small hemorrhages. There is retention of the urine. The liver is greatly enlarged (nutmeg



Case No. 14. A Typical Field Case. Note the attitude of the ears, ptosis, dropped lower lip, bracing attitude of the legs and head turned to one side.

liver) congested and cloudy swelling. The kidneys show active and passive congestion and cloudy swelling. The heart shows congestion with small hemorrhages under both the epicardium and endocardium. There is a normal amount of pericardial fluid. There is congestion of the brain with appearance of inflammation. There is also some pin point hemorrhages in the ventricles of the brain. The spleen is about normal size with nodular thickenings. There are hemorrhages throughout the cancellated portions of the long bones.

CASE NO. 14—History: Gray mare, twelve years old. This animal has been sick eight hours. This animal has never been on pasture but kept up for routine ranch work and on mature feed. The water was from an 800 foot well at all times.

Symptoms: The head is turned to the right side. There is grinding of the teeth. There is a nervous twitching of the head. This animal has some difficulty in swallowing. There is great

weakness and prostration. The animal stands in a bracing attitude. See photograph No. 1. The eyes are partially closed, the ears are weaving to and fro. The lower lip hangs pendulous and the nostrils are dilated. There is some weaving of the body and the reflexes are partially absent. The hind legs are at times crossed and the fore legs spread far apart. The breathing is shallow. At this time the temperature is 104.2 degrees Fahr. The pulse is 52, full and weak. The respiration is somewhat accelerated. There is some slobbering. There is a peculiar smacking noise made by the mouth. The tail is paralyzed. The head at times is carried rather high. The crural group of muscles on the left side are in a state of tremor. The animal stands but cannot walk, and when urged to do so falls to the knees, but with time regains her foothold and arises. There is a droopy condition of the ears. There is ulceration of the mucous membranes of the lips. The pupils are not dilated.

The eyeballs roll back and forwards in their sockets. Later the breathing is labored, dilated nostrils, reflexes absent, no vision, she goes down. The legs are extended and stiff. The pulse is still large and full. After remaining unconscious for several hours she is destroyed for autopsy purposes.

An analysis of the urine shows the following: Specific gravity 1.030. Sugar is present in considerable quantity. There is no albumin.

Autopsy: The tongue is coated with a fuzzy, whitish sticky material. The pharynx, larynx and trachea are normal. The gastro-intestinal tract is normal except a portion of the colon about one foot long, which shows some congestion and slimy-like mucous. There is a catarrhal inflammation of the bladder with small pin point hemorrhages. There is a considerable quantity of calcium salts in the bladder. The liver is enlarged and shows congestion and cloudy swelling. The kidneys show active and passive congestion and cloudy swelling. The brain shows active and passive congestion and more or less evidence of inflammation.

MICROSCOPIC FINDINGS.

The microscopic study of sections from various tissues of field cases after hardening in 10 per cent. formaldehyde and embedding in celloidin and staining with hematoxylin and eosin showed the following:

Liver: There is active and passive congestion present. There is cloudy swelling and some areas of focal necrosis. There are some areas of round celled infiltration with a few polymorphonuclear cells.

Kidneys: There is active and passive congestion with a few focal areas of cellular infiltration mostly round celled. Cloudy swelling is present.

Pharynx and Larynx, as well as the stomach and intestines, when affected show congestion and some areas of cellular infiltration.

Heart: There is a congestion of the myocardial vessels.

Brain: The pia-arachnoid membranes are in a state of congestion and infiltrated with round cells and polymorphonuclear leucocytes—acute inflammation. Cellular infiltration like that of the coverings of the brain is especially well marked in the cerebrum perivascularially and focal areas throughout the brain substance. Small areas of hemorrhage are noted through the brain substance. The vessels are congested.

Spinal Cord: The section through the central canal shows many leucocytes, many are polymorphonuclear. There is quite an infiltration around the canal in the cord substance. In the cord substance and particularly in the ganglionic part there is a cellular infiltration as well as a few focal areas of round cell and polymorphonuclear infiltration. The coverings of the cord are congested and are at points infiltrated to a more or less extent as the brain.

Urine Study: The urine was studied in 4 cases. In none was albumin found. There was sugar found in two of the cases. The specific gravity ranged between 1,022 and 1,050. Calcium salts was also abundant and in suspension. The urine was always slightly alkaline.

Blood Study: A differential blood study was made on six cases with the following results:

Case No. 1: Neutrophiles, 94 per cent.; lymphocytes, 6 per cent. *Case No. 3:* Neutrophiles, 76 per cent.; lymphocytes, 21 per cent.; mononuclears, 2 per cent.; eosinophiles, 1 per cent. *Case No. 4:* Neutrophiles, 91 per cent.; lymphocytes, 8 per cent.; mononuclears, 1 per cent. *Case No. 6:* Neutrophiles, 88 per cent.; lymphocytes, 10 per cent.; mononuclears, 2 per cent. *Case No. 7:* Neutrophiles, 89 per cent.; lymphocytes, 11 per cent. *Case No. 14:* Neutrophiles, 98 per cent.; lymphocytes, 2 per cent.

BACTERIOLOGICAL STUDY.

Only a preliminary report can be made at this time on our bacteriological study as the disease subsided before this part of the work was completed.

The spinal fluid was obtained at autopsy by carefully cutting away the musculature over the occipito-atloid space, searing the surface with a hot spatula and drawing the fluid with a sterile syringe and placing the fluid in a sterile bottle.

In the fluid examined from 18 cases at autopsy there was found a coccus, at times in chains and showing a diplococcic arrangement. The organism lost practically all the gram stain so that it was practically gram negative although it may by some be considered as laying mid-way between gram positive and gram negative. The constancy of the presence of these organisms drawn under these conditions prompted us to try inoculations. These organisms were found in spinal fluid from cases which had been killed for autopsy purposes hours before they would have died from the disease.

This organism forms a dirty gray growth on agar plate. It has smooth borders and is slightly raised. It does not liquefy gelatin. It forms a filiform growth on agar slant, showing no tendency to spread.

This organism when injected subdurally in two horses produced symptoms simulating the field cases and at autopsy showing some of the lesions found in the field cases. When inoculated into the jugular vein it produced toxic symptoms from which the animal showed a tendency to recover, but repeated doses proved fatal.

This organism is always fatal when inoculated subcutaneously, subdurally or intraperitoneally into rabbits and guinea pigs, the guinea pigs showing more resistance than the rabbits.

Chickens showed no ill effects when inoculated by the mouth or intraperitoneally.

Dogs showed no ill effect when given subcutaneously, but some toxic effects when given intraperitoneally, and fatal when inoculated sub-durally.

In addition to this organism above described there were five other diplococci studied and proven separate and distinct micro-organisms and by animal inoculations to be non-pathogenic. At this time these organisms may be regarded as saprophytic and associated with the horse. For convenience these organisms will be regarded as numbers 1, 2, 3, 4 and 5.

Diplococcus No. 1: Upon agar the colonies resemble that of the micrococcus catarrhalis of the human. The colonies appear with a light border with a denser center, taking on a yellowish tan tinge with age. The border is irregular. The center is raised. The colony is friable, not viscid. The colony may at-

tain the diameter of 2.5 to 3 m.m. It grows rapidly at room temperature. It is gram positive. It stains well with ordinary aniline dyes. It is biscuit shaped, most often in pairs. The approximating edges are flat.

Upon agar stroke there appears a luxuriant growth, wrinkled with no tendency to spread, at first white, later it takes on a yellowish then a yellowish tan color.

In bouillon it produces only a slight cloudiness and a whitish precipitation.

In gelatin growth takes place along the entire needle tract. The surface growth is limited, showing no tendency to spread, and first white, later a yellowish-tan tinge. No liquefaction takes place.

The organism is both aerobic and anaerobic.

Diplococcus No. 2: This diplococcus appears as a grayish colony with intact border and a denser center. Upon agar plate these colonies do not attain the size of diplococcus No. 1. The maximum diameter is from 1 to 1.5 m.m. It stains with ordinary aniline dyes and is gram positive. It grows readily at room temperature. Older cultures become wrinkled, grayish and brittle. The contact borders of the cocci are flat.

On agar slant the growth shows no tendency to spread, is echinulate. Older cultures become wrinkled, elevated and gray.

Diplococcus No. 3: On agar plate the colonies attain the size of .5 to 1 m.m. in diameter and are a light tan color. On agar stroke it has a tendency to grow beaded. The micro-organism stains with the ordinary aniline dyes and is gram positive. The contact borders are rather flat.

Diplococcus No. 4: On agar plate the colonies are whitish-gray and may attain the diameter of 1 m.m.

On agar stroke the growth has a tendency to appear beaded. It does not liquefy gelatin and grows along the entire needle tract.

In bouillon it may form chains. The bouillon is clouded. It grows readily at room temperature. It is gram negative. It stains readily with the ordinary aniline dyes.

Diplococcus No. 5: In gelatin stab it grows along the entire needle tract. It does not liquefy gelatin.

In agar stab growth takes place along the entire needle tract.

On agar plate the colonies appear as whitish to whitish-gray and attain a diameter of .5 m.m. These colonies closely resemble those of streptococci.

On agar stroke a beaded growth appears.

In bouillon it may appear in chains. The bouillon becomes clouded. It is gram negative. It grows readily at room temperature.

DIFFERENTIAL DIAGNOSIS.

Poisoning from eating sprouting potatoes when it is said large quantities of solanine is contained in the peeling of the potatoes produces symptoms which have been mistaken or have been referred to as identical with the horse plague.

Poisoning with moldy worm-eaten corn has been referred to as identical with the horse plague. In all our autopsies we did not find liquefaction necrosis as is always present in the moldy corn poisoning cases, although some of our cases lived several days before dying.

Sugar beets when becoming rotten, as well as other root crops, produce a condition which has been likened to the horse plague.

There are many practitioners who are careful observers and who worked in the stricken district who share the views of some of the laboratory men that the horse plague is a separate and distinct disease.

Sage Poisoning: During our investigation work at Holly, a call came from Fowler, Colorado, to come and investigate a disease feared to be "horse plague."

History of the Outbreak: The pasture is hilly and covered with native grass. It contains considerable sage which has seeded.

Horses pastured on this ground four years previous contracted the same disease. That was at the same time of year after the sage had fruited. It was noted that the horses acquired a liking for the sage. About thirty horses were pastured on this field and six had become affected.

Four of the cases were only slightly affected and soon recovered, while two were extremely ill and are here described.

Case No. 5: Bay mare two years old. Had been down 48 hours, but is now up and eats and drinks. There is no difficulty in swallowing. The animal appears nervous. There is a stiff gait and considerable weakness. The entire vertebral column shows a peculiar stiffness. The vision is partially affected. The head is not turned to one side. There is no grinding of the teeth. There is no droopy eyelids. Many other symptoms of "horse plague" are absent. This case finally recovered.

Case No. 6: Brown gelding, 2 years old. This animal has been down 24 hours. The temperature is 101.2 degrees Fahr.

There is a stiff gait, the animal is nervous. The head is carried rather high. The vertebral column is carried rather stiff.

It has been noted that in pastures containing *Artemesia filifolia* (one species of sage), that horses acquire a taste for it; particularly after frost has killed the buffalo and other grasses.

Some experiments were conducted by the writer, but only a preliminary report can be here given.

A tincture was made from the dried sage gathered from this field. The following experiments were run.

Experiment No. 1: A young fox terrier dog weighing 18 pounds was given 7 drams of this tincture by the mouth. This was given at 9.40 A. M. on an empty stomach. At 9.50 A. M. the animal rolls. At 10.00 he appears weak, partially paralyzed in hind quarters, staggers and repeatedly falls. At 10.07 there is normal defecation. At 10.11 he vomits. At 10.17 there is marked depression. He lays down continually, and at 10.24 he again vomits. At 11 the extreme symptoms are subsiding.

A check was run on this test. The dog used was one weighing the same. This dog was given the same quantity of alcohol that was contained in the tincture that was given to the dog in experiment No. 1. The animal rolled, appeared slightly intoxicated, but did not vomit or show weakness of the hind quarters.

Experiments Nos. 2 and 3 were conducted in a like manner and gave similar results.

Experiment No. 4: A white rabbit weighing about 4.5 pounds was given 4 c.c. of the tincture intraperitoneally at 4.35. At 4.38 the rabbit showed weakness of the hind quarters, accelerated respiration, involuntary urination, stilty spinal column. At 5.18 the animal cannot walk, lies prostrate. At 5.22 he can sit up and when urged can walk some. At 8.30 A. M. on the following day the animal sits and walks but appears ill. The surface of the body is cold, indicating poor circulation. The head is thrown back, the temperature 94 degrees Fahr. The animal died the morning of the 24th.

Autopsy: The meninges are congested. The venous sinuses and veins of the cord and medullary region are congested. The liver is of normal size but shows passive congestion. The heart has apparently stopped in diastole.

A rabbit of the same weight was given the same quantity of alcohol contained in the tincture given to the experimental animal and in the same manner. This rabbit showed intoxication, but not the peculiar stiff spine of the same degrees of affection of the hind quarters.

It is recognized that strong infusions of *Artemesia filifolia* produce nausea and vomiting in the human. After its administration sleep ensues with free perspiration. The action of the heart is increased.

The plant grows about one foot high, presents a silky appearance, the stems are single or branches, and bear numerous racemose disposed heads in an open panicle. The leaves are divided into linear crowned lobes. It is found in the Rocky Mountain region. So far as the writer knows, those working in the field have not been able to reproduce "horse plague" by feeding moldy hay eaten by horses contracting the disease, although such experiments were conducted. Neither has the disease been produced by growing any of the various molds (found on such hay) in the laboratory and feeding it to animals.

We believe that at the present time no one can definitely conclude just what the cause is, and any such statement must be regarded as poor judgment. Future study, should this identical disease reappear, must be made along the lines followed in the last outbreak.

TWO INTERESTING COW CASES.

By E. A. WESTON, B.V.Sc., University of Western Australia, Perth, W. A.



First Case. Red, crossbred cow milking in one of the dairies supplying this city. She was unthrifty and reported to be affected with chronic diarrhœa. I decided to tuberculin-test her. She was inoculated 8.30 p. m., when she showed a temperature of 103° F. The subsequent temperatures were as follows, the first one being taken at the twelfth hour after inoculation:

12th	15th	18th	21st
101	101	103.4	105.6

On post mortem she proved to be extensively affected with tuberculosis, and photo No. 1 shows a portion of her costal pleura. This case serves to further emphasize the unsoundness of the dictum that no further temperatures need be taken if no rise occurs by the 16th hour. On two other occasions I noted temperatures showing a slight rise on the 18th hour, and giving a typical reaction on the 21st; but I had not an opportunity of confirming the test by post mortem.

Second Case. Photo No. 2 shows a long piece of bone encysted in the anterior lobe of the right lung of a cow, which I



destroyed for tuberculosis on account of cough, wasting and other suspicious clinical symptoms. She proved to be affected, though not as extensively as I had anticipated. There was, however, an extensive dry pleurisy, with numerous adhesions, and when pal-

pating the lungs I encountered a hard substance. On cutting down on it, I discovered the bone shown in the photo. The black object seen underneath it is the handle of a scalpel inserted to show the bone up better. Where this bone came from I can only surmise. It did not lie in a bronchus and could hardly have come via the trachea. On the other hand, there was no track to mark its passage from the reticulum. I am inclined to think, however, that it came via the stomach, and was for a time free in the thoracic cavity, thus setting up the extensive pleurisy seen on post mortem.

MEDICINE DIRECT.

By W. B. COOK, D.V.M., Albany, Oregon.

The case, one of flatulent colic in a valuable heavy-draft mare. I was with this animal the most part of time, from 3 p. m. on Friday until 7 p. m. on Saturday, during which time I had given medicine regularly, such as the aromatic spirits of ammonia, the extract of capsicum, turpentine, nux vomica, aconite and arecoline hypodermically. Having passed the stomach tube four different times, giving medicine in buckets of water at such times. I also gave four rectal injections and tapped the animal twice on Friday, the first time at 3 p. m. and again at about 11 p. m.

I won't attempt to describe symptoms in detail. All are familiar with such cases and know that the symptoms change greatly from hour to hour.

By 5 p. m., Saturday, my case seemed hopeless. The animal was bloated up like a balloon again. I decided to tap her a third time, which allowed a great quantity of gas to escape.

Then I proceeded to get medicine to the right spot. With the canula in position, I injected through it into the intestines three drams of the carbonate of ammonia dissolved in about two ounces of water and half an ounce of aromatic spirits of ammonia diluted in water.

I left the animal quite at ease at 7 p. m. At 8 a. m., Sunday, I learned by 'phone that the mare had drank quite a lot of water towards morning, was up, and had an appetite for breakfast.

She had no more symptoms of bloating and recovered beautifully.

This is the second time I have used the trocar and canula in this way and with excellent results.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

SCROTAL HERNIA IN A FOAL [*James Gregg*].—A valuable, pure-bred Shire foal, 24 hours old, has scrotal hernia. He has difficulty in passing feces, strains considerably. There is a swelling as big as a cocoanut in the off groin. The little fellow has abdominal pains, stopped sucking and is very weak. Put on his back, and held with three men, the parts are well washed and disinfected, and by careful manipulations the hernia is reduced. The skin was then incised and the testicle removed by covered operation, about $\frac{1}{2}$ inch below a ligature applied on the hernial sac, as high as possible. Few sutures closed the skin wound. Careful antiseptic measures were ordered. The foal got up after the operation, had a suck, a motion of the bowels and gave no further trouble. The external stitches were removed after three days. The after-treatment consisted in the administration of 2 ounces of castor oil and boric acid lotions applied twice a day.—(*Veter. Record.*)

LYMPHADENITIS AND MULTIPLE CUTANEOUS TUMORS IN A HORSE [*A. Kragerud*].—The case, on superficial examination, looked like glanders. The animal was covered with numerous round nodules, arranged partly in ranks and varying in size from that of a hazelnut to a walnut. There was greyish serous discharge from both nostrils, and in the nose little, round, raw surfaces. The appetite was good and the general condition unaffected. On post mortem the raw surfaces were found on the nasal mucosa. All the lymphatics of the body were swollen. According to the writer, the disease began three years previous: the horse had been treated for strangles. It was only recently that some of the nodules had ulcerated.—(*Veter. Journ. and Deuts. Tier. Woch.*)

SARCOMA OF THE STOMACH IN A HORSE [*Chief Veterinary Surgeon Mallauer*].—A seventeen-year-old horse has always been a good eater and worked well. For a year past he has lost flesh and became reduced in condition. He is almost a skeleton. He was destroyed. The post mortem revealed degeneration of the stomach, which was as big again as normal and showed externally raised spots, as large as a child's head, which were hard, and some others fluctuating. Inside the organ there was thick pus, which had escaped through fistulous tracts, opening and running through the mucosa and in various parts of the tumors seen outside, on the external surface. The examination of the stomach, when completed, brought out the conclusion that the case was one of sarcomatous degeneration of the organ.—(*Veter. Journ. and Zeitsch. f. Veter.*)

PARTURITION CASE [*Gray Sutton, F.R.C.V.S.*].—One bitch, toy variety, was mated with success. At term she has great difficulty and pains to deliver. The vagina is so constricted that a finger can scarcely be introduced. The uterus is well up. The membranes have ruptured. With difficulty the head of a puppy can be seized and crushed with a forceps introduced with great care; the puppy is brought near the vaginal outlet, but no further. An operation is decided and the abdomen opened. It contains foetal fluid and shows a tear of the uterus. This organ and the contents are removed, the abdomen flushed and cleaned with boiled water. The uterine stump was swabbed with iodine solution diluted. The uterus contained a large puppy. Recovery was uneventful.—(*Veter. Journ.*).

CEREBRAL PARALYSIS [*James Charlmers, M.R.C.V.S.*].—Rough-haired Irish terrier dog is found lying huddled up and apparently unconscious with blood over the head and running out of the nose. He was affected with cranial hemorrhage, epistaxis and secondary paralysis. The temperature was $100^{\circ}.6$ F. The trouble was due to a shot wound, a small bullet having entered on the right side of the median line, on top and back of the head, having glanced through the skull to come out on the left of the median line in front of the symphysis of the inferior maxillary bone. The right eye was distended with hemorrhage and the ocular lumen suffused with blood. *Treatment*—No probing of the wound, which was treated externally only with lotions of chinisol. Inhalations of terebene and tincture of benzoin were used to keep the nasal cavities cleared. Internally pills of bromide

of potassium and ammonium were administered. Iodide also with strychnia. Diet, milk, eggs and nutritive gruel.

After two days slight improvement made its appearance, and with tonics, stimulants and stronger food the animal began to attempt to walk, with the peculiar symptom that he lifted the front paws high off the ground. He had also a tendency to collapse on the right side. Recovery gradually took place, leaving the patient with the peculiar action of its fore legs and a small exostos is on the parietal bone where the bullet had penetrated.—(*Veter. Journ.*).

UNUSUAL SEQUELA TO CASTRATION [*Arnold Spicer, F.R.C.V.S.*].—Three colts were castrated. Two were two years old, the third a yearling. The oldest teased the young one so much that he had to be taken in at night, passing through a very dirty yard where he was kept. After the fourth day, while the two-year-old colts were doing well, the yearling began to swell down the near hind leg and along the belly and sternum. In about a week the skin sloughed from the scrotum to and along the near side, about nine inches wide. There was also a bad slough on the near side of the scrotum and one on the inside of the thigh. The colt never went off his appetite. It was a bacterial infection contracted while going through the yard or in the box, which was covered with peat moss.—(*Veter. Record*).

AN EXTRAORDINARY INJURY [*J. C. Powell, M.R.C.V.S.*].—Two-year-old pony had been turned out. He is found in the morning struggling in the field, cast with the off hind foot tightly entangled in his mane, and so securely was the foot tied up that a considerable portion of the mane had to be cut off to free the leg. When the colt was relieved, it was found that there were such severe injuries of the ligaments of the stifle and of ruptured muscles that the animal was destroyed. It was certainly an extraordinary case.—(*Veter. Journ.*)

PYELO-NEPHRITIS IN A FOAL [*W. R. Davis*].—Valuable thoroughbred foal, a few weeks old, was removed from the stud farm in a cart, and the next day was unable to get up, had profuse diarrhoea and was lame on the off hind leg. The navel was still open and suppurating. The writer made it a case of navel-ill, and treated her with bismuth hæmatoxylin and resorcin, nuclein hypodermically and chinosol solution on the navel. The off hind leg was sore, and on the near fore there was a swelling

of the elbow, which was also quite painful. In the course of a month the foal improved and was turned out to grass. Some days after, swellings appeared on the head, breast and abdomen. Food was refused, violent colics were exhibited, and death took place. At post mortem were found the urachus thickened, inflamed and hemorrhagic, the bladder empty, with the walls thick and the mucous membrane swollen, pulpy and very red. The kidneys were greatly enlarged and in their distended pelvis there was muco-pus, the kidney tissue being flabby and friable, making it difficult to distinguish between the cortex and the medulla.—(*Veter. Record*).

UNUSUAL SUSCEPTIBILITY TO COCAINE [*R. S. Little and D. Starkey*].—Eight-year-old gelding is to be operated with plantar neurectomy. Five cubic centimeters of a solution of cocaine hydrochlorate were dissolved in equal quantity of water and adrenaline, 1 in 1,000, and injected by half on each side of the site for the high operation. A few minutes after, the animal became restless and sweated profusely. There were tremblings, slight twitchings of the muscles of the hind quarters and some unsteadiness in the gait. There was some hyperthesia, short abdominal respiration. Temperature, 101° F.; pulse 50, hard and strong at first and later dropping to 40. These symptoms subsided gradually, but took half an hour before they disappeared entirely. The operation was performed when the symptoms had sufficiently diminished to allow it. After being well rubbed and dried, the horse was taken home.—(*Veter. Record*.)

EMPIRICAL THERAPEUTICS [*J. G.*].—Records of peculiar and curious therapeuty of little scientific renown.

1°. Pure-bred short-horn heifer had occasional diarrhœa and was unthrifty. She is now reduced to the condition of a walking skeleton. Every mode of treatment has failed to help her. A proprietary article, mostly made up of tobacco, was given to her. The effect was marvelous and recovery rapidly followed.

2°. Two-year-old bull had diarrhœa; all forms of treatment failed, and the animal gets thin and weak. Quarter of a pound of black cut Cavendish tobacco is boiled in two quarts of water, divided in three doses. One is given every day for three days in succession. The diarrhœa gradually diminished, stopped and in a week normal feces were passed.

3°. Three-year-old cow had red water, was in the last stages and in condition of dying. She is turned out in a field where there was a tub containing water, where it had remained for at

least two weeks. It was covered with green slime and had a bad odor. The cow was thirsty; she emptied the whole tub almost. The next day the urine was considerably clearer, and on the second day it was quite clear. The cow made a good recovery.—(*Veter. Record.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

EXOSTOSIS OF THE VERTEBRAL COLUMN CAUSES HEMORRHAGE OF THE VENA CAVA [*Lieut. Lagaille, Army Veterinarian*].—*Vigilante*, aged 14 years, after jumping a bar, falls down, remains on costal decubitus for one minute and gets up. She staggers for a few steps and then appears in normal condition. She is placed in observation. The next day she is taken out, moves a little stiff first, but trots well and at the end of the path where she is exercised a short and sudden turn is made. Suddenly she staggers, drops and, unable to rise, she is transported to her stall, where, after hours of manifestations of internal hemorrhage, she dies.

At the autopsy the abdomen was found full of blood. There is a big clot between the peritoneum and the superior wall of the abdominal and pelvic cavities. The vena cava has, opposite the vertebral column, a large laceration with ragged edges; the posterior aorta is irregularly contracted by pressure of exostosis, occupying the bodies of the dorsal and lumbar vertebrae. An ankylosing osteitis has transformed the vertebral column into a stiff rod by ossification of the vertebral cartilages and union of the bodies of the vertebrae, which are more or less covered with bony deposits of various size. The last lumbar vertebra has one, triangular and sharp, which is opposite the vena cava and the cause of the venous injury. Besides these lesions the mare had ankylosis of both hocks, lesions of endocarditis and cardiac hypertrophy.—(*Revue Veter.*)

ACTINOMYCOSIS IN A CAT [*Prof. Dr. V. Ball and Mr. Roguet*].—Pulmonary actinomycosis, observed in man, cattle, sheep, pigs and dogs, has been reported only by Hutyra and Mareck as having been found in two kittens. The authors publish one found in a six-and-a-half-year-old black cat. He had alveolodental osteo-periostitis on a level with the inferior maxillary bone, marked dyspnoea, and a rather frequent cough. Placed in observation, he died after five days. At the autopsy there was

found a double chyliform pleurisy with abundant exudation. The pleura was covered with yellowish fibrinous exudates. The lungs were the seat of pseudo-lobar broncho-pneumonia with grey hepatization and grey yellowish centers. The lymphatic glands were enlarged, greyish and yellowish spots. Parasitic tufts were also observed in the center of the pneumonic cellular lesions. These actino- mycotic tufts were well marked.—(*Journ. de Zootechn.*)

TELLURATE OF SODA IN CANCEROUS NEOFORMATIONS [*Mr. P. Pierre*].—After the results related by Wasserman, the writer records the following as experiment: A slut, operated two years before, for a tumor of the mammæ and which had recovered, was again six months after brought to Mr. Pierre because of a kick she had received on the right forearm, which had given rise to a tumor, which was rapidly getting as big as the fist. Three removals were followed by three returns of the growth and besides by the appearance of centers of generalization on the lumbar and right costal regions. The anti-brachial and the lumbar tumor received, each, three injections of 2 c.c. of saturated solution of tellurate of soda, made three days apart. On the sixth day the lumbar growth underwent cystic transformation, as described by Wasserman, with the escape of blackish discharge, and the anti-brachial tumors presented fluctuating spots which on puncture gave escape to the same blackish discharge. The microscopic examination of the growth revealed their nature, viz., epithelioma of mammary origin.—(*Rec. de Medec. Veter.*)

INTESTINAL OBSTRUCTIONS IN RUMINANTS [*J. Guittard*].—For the author these affections can be classified as *complete* by invagination or hemorrhage and *incomplete*.

1. *Complete obstruction* by invagination or volvulus are indicated by violent colics that subside after a few hours, but never disappear entirely. And again by the stretched position of the body on the four extremities, flatulency after the second day, standing position longer and in preference to the decubital, pulse running down to 100, 110, 120. Expulsive efforts. Rectal examination reveals a smooth, bosselated mass. Complete anorexia. No tympanitis. Glairy feces tainted with blood.

2. *Obstruction by Hemorrhage*. Such similar symptoms, except stretched position on the four legs; feces sanious, brownish and glairy.

3. *Incomplete Obstructions*. They are due to limited invagination, intestinal contraction, peritoneal adhesions. If colics are

present, they are slight and intermittent; anorexia is intermittent also. Rectal examination is negative; feces and false membranes collect in the rectum. Flatulency sometimes excessive or again intermittent.

This obstruction is more difficult to diagnose, as it may be easily mistaken for gastro-enteritis, acute enteritis, indigestion, recto-colitis, cystitis, kidney diseases, sarcoma, etc.—(*Progres Veter.*)

HETEROCHRONOUS MILK SECRETION [*MM. Ligeron and Le-sage*].—Relatively frequent in young children, such cases are exceptional in animals. Although few are on record, not only amongst females, but also in male individuals. For instance, that of Madel who saw a two-days-old colt give milk for six weeks and that of Barbazan who visited a male goat of two years, which performed his functions of male normally and gave excellent milk from two inguinal teats situated in front of the spermatic cord.

The case of the writers was a filly which, from birth and before she could stand up, and running from her mammæ a creamy white fluid, resembling milk. From birth, the mammæ of this little animal grew larger, and on the fourth day they were as large as a big hen's egg and secreted more than 150 c.c. of very white milk. Applications of populeum ointment were made, and after three weeks the secretion was reduced to only a few drops.—(*Bullet. de la Soc. Centr.*)

RARE TUBERCULOUS LESIONS IN BOVINES [*Prof. Dr. Fairise and Mr. J. Charton, Army Veterinarian*].—Two cows in fair condition showed these lesions, viz., on the synovial bursa, which allows the gliding of the tendons of the semi-tendinosus, the adductor of the thigh, and the tibial apo-neurosis over the bony structures underneath. In one cow the lesion existed in both stifles, and on the other only on the right one. They were all alike. On the living animal they consisted in a swelling on the internal face and a little in front of the femoro-tibio-patellar joint region, forming a very hard mass. After slaughter they appeared as a discoidal mass, 10 or 12 centimeters round, situated under the tendons mentioned and covered with a thick fibrous envelope. The inside was divided by sclerous septa forming small cavities filled with caseous or caseo-calcareous matters. *There were no other macroscopic tuberculous lesions in the lungs, nor in the lymphatic system.* Histological sections made showed clearly the tuberculous nature of these masses.—(*Rev. Gener. de Medec. Veter.*)

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

The fiftieth annual convention of the American Veterinary Medical Association was called to order at the Hotel Astor, New York City, on Monday, September 1, 1913, at 10.45 a. m., by the President, Dr. John R. Mohler, who said: "*Ladies and Gentlemen:* The fiftieth annual meeting of the American Veterinary Medical Association is now formally declared in session. It is indeed highly pleasurable to me to see such a large number of friends and visitors here this morning to attend this convention, and I sincerely trust you will all enjoy yourselves most pleasantly, and that we shall have a successful meeting.

"Now, we have with us this morning a gentleman who has shown his friendship for our profession on numerous occasions, and I take great pleasure in introducing to you the Honorable J. A. Goulden, United States Representative in Congress from New York, who will deliver an address of welcome to this beautiful and prosperous city."

CONGRESSMAN GOULDEN'S ADDRESS OF WELCOME: *Mr. President, and Ladies and Gentlemen*—This is an unexpected pleasure, and a privilege that I am enjoying this morning. Last evening, at about half-past eight, one of my constituents got busy over the telephone. I sometimes regret that I have a telephone in my house. But he got busy and, as a consequence, I am here this morning to take the place of the chief magistrate of this city, the distinguished mayor, Honorable William J. Gaynor—not at his request, but at the request of my good friend, the gentleman who is sitting on the platform here with me this morning, Dr. Ellis. I regret exceedingly that his Honor the Mayor is not here, for I consider him one of the happiest men; that is, a man who makes the happiest speeches of any man I ever met upon an occasion of this kind, especially in extending greetings and a cordial welcome to the city. Whether it is too much politics, or the heat that is operating to keep him away, I do not know, but I know that unless he had been ill, or some-

thing important had occurred, he would have been here this morning to have greeted you.

It is a pleasure to welcome a body of ladies and gentlemen such as this to the metropolis of the country. You are an intelligent body of men, and you are engaged in a work that is meeting the commendation of every one who understands it, and which is gradually becoming better known. I am told that since you allowed the ladies to participate in your gatherings, that since you admitted them into the convention held some eleven years ago (and I believe I am right about that), that the attendance has been much larger, and that everything goes along smoother and better, easier and nicer. That is as it should be. You know that away back, many years ago, the Lord decided that it was not well for man to be alone, and so he created him a mate, and from that day to this we have always been delighted and glad to have the Eves with the Adams, not alone upon occasions such as this, but on every occasion. The fact is, we enjoy their presence and company.

The work in which you are engaged is of that high order that it must of necessity commend itself to the American people. I regret that some people at Washington did not appreciate the bill which passed the House about a year ago giving the veterinarians in the army a rank. That bill passed the House (of which I am glad to be a member and have been for about ten years) unanimously. It was sent over to the Senate, and I regret to say that a man from the far West pigeon-holed the bill. I liked it because I believe you are entitled to it. I believe you will never accomplish what you should—and what can be accomplished in the army unless veterinary surgeons are entitled to some recognition in the way of proper rank by law? Now they are simply looked upon in the light of non-commissioned officers, but with no standing whatever, and in order that they may do the work which is highly necessary in the army they should do, they must be given a proper standing. This is necessary not alone for the sake of the beast, but for the standing of the men as well, and until Congress gives them this rank, I think you will not have fully accomplished the work which you have sought to do. Upon an examination of the exhibition at the other end of the building, I took notice of many interesting things, and it has been to me a source of the greatest gratification as well as of study to feel that you are doing what I am convinced you are—for the uplift not only of the dumb beast, but of the human family as well. It is my pleasure to be connected with two large

institutions in this country, one an agricultural school, or college, and the other the State Soldiers and Sailors' Home at Bath, and I note that through the veterinarians of the state we have accomplished a great deal of good in the eradication of tuberculosis from our large herds of cattle. I am firmly convinced (I am not undertaking to talk technically at all, because I know very little about the matter from that side), but I am firmly convinced that the work in which you are engaged is not only of great benefit to the poor dumb beast, but it is of exceedingly great value and benefit to the human race. Both features of it are to be commended. Both are to be praised and both are entitled to the serious consideration of the world at large, and when your work is once understood, as it is becoming understood, you will have no trouble whatever in receiving that encouragement and assistance to which you are entitled. Your business to-day is entitled to recognition as a profession—a learned profession—because in your ranks are men of education, men of standing, and men of character. Perhaps twenty-five or thirty years ago it might have been somewhat different. In those days the term "horse doctor" was considered as a fitting appellation for the veterinary surgeon. That has passed away. I have not heard that for a long time, and I therefore congratulate you that you are by your own efforts, and by the beneficial character of the work in which you are engaged, and by the results which you have achieved, gradually forcing yourselves into the proud position, with higher activity, as members of a learned profession.

Now, we are sincerely glad to have you come to New York, a city noted for its great developments along all lines, noted for its commercial supremacy, noted for its institutions of learning, for its schools, and its academies, its colleges and universities. New York stands well to the front, not only among the cities of America, but among the cities of the world, as a great commercial centre, noted for its activities along all lines of human endeavor; therefore, we are glad to have so distinguished and learned a body of men and women as are numbered among the members of this association present here to-day, and we extend to you a cordial greeting. We bid you a hearty welcome, and we hope that your deliberations here will be of benefit not alone to yourselves but to mankind at large, and that you may go away from here feeling that New York City is a good place to visit, and that New York City is a good place in which to spend some time. Therefore, in the name of the people, I bid you a most cordial, a most hearty welcome, not only to our city, but to our homes, and to our hearts. Again I bid you, every one, a cordial welcome to New York City. (Applause.)

PRESIDENT MOHLER—I am certain that we all appreciate the cordial welcome which has been extended to us by Congressman Goulden, and I shall now call upon one of the oldest and most honored members of the association, Dr. W. Horace Hoskins, to respond to this address of welcome.

DR. HOSKINS' RESPONSE TO THE ADDRESS OF WELCOME:
Mr. President, Congressman Goulden, Ladies and Gentlemen, Fellow Members of the Veterinary Profession—I deem it a special privilege this morning to be called upon to answer, or to respond to this address of welcome to this great city of New York. I am doubly wedded to this great city and this great state in two particular ways. First, I am one of the graduates of one of the earliest veterinary institutions in this land, one that has spent its existence in this city; and secondly, I am wedded to this association and to its great service for the public good, because it had its birthplace in this great city. New York has been, as a state, prodigal indeed in all that has pertained to the veterinary profession, and in the relation of that profession to the people of this country. It gave it a private institution which was the first of the veterinary colleges that have maintained a continuous existence from its inception in 1857 up to the present time. New York was likewise one of the first states that has recognized her duty to her people and made the study of veterinary medicine possible by the establishment of two state schools. We have long recognized the duty of the state to take up as a part of her duty the support of veterinary education and veterinary science, because the work in which we are engaged is not one which promises affluence, to say nothing of competence in old age. It is a public service. We are engaged in the great work of extending animal industry, and its association, and the veterinary profession is having, as a part of this service, the control and eradication as well as the amelioration of the effects and causes of those diseases that are transmissible from the lower animals to man. In another way, New York has been prodigal to the veterinary profession in this land, in giving to it some of those men who have led the profession for more than fifty years. In sunny France there rests, in the evening of his life, Prof. A. Liautard, the founder of the first school in this city in 1857, and the only living man who has had continuous membership in this association from its inception in this city in 1863 to the present hour, the one man above all others who has had deep in his heart the advancement and progress of veterinary medicine along the lines in which he

established it. We are living to-day, fifty years after the birth of this association under the same code of ethics, and under the same ideals that he contributed so much to establish fifty years ago. We have no legal entanglements of any kind, but are bound one to another for the moral uplift of our profession and for its progress and advancement by the principles of conduct which he was among the first to point out and establish, and in speaking of these, we must not forget that up in the central portion of the state there lingers another man in the evening of a well-spent life, Professor Law, another of the pioneers who early established a veterinary course in connection with Cornell University. He has lived to see as the result of his labor the growth of one of the strongest state veterinary schools that we have in this country, and so I might go on and speak of what New York has given to us in the way of men from these schools to this country, who have borne such an important part in the advancement of veterinary medicine and in their contributions to the success of the federal department established by the United States Government, the Bureau of Animal Industry, and to the success of the veterinary departments which have been established by the various state governments. New York has been prodigal indeed in its contributions to the advancement of animal industry, in the solution of those problems that have confronted the profession, and in the production of those men who have contributed so much to make the veterinary profession a respected and honored one wherever it is known; who were ready at all times for useful service in the uplifting of men in this profession and to the fellowship of its members, and to all departments of the great progress which this country has made along veterinary lines. We are here to-day to celebrate this fiftieth anniversary. This golden occasion, with a membership on our rolls of almost two thousand men; with eleven hundred men of our profession engaged in work in connection with the federal government, and hundreds of them in state and municipal governments—all of them rendering a service to this country that cannot be mentioned in any monetary sense, because their work is for the protection of human life from infancy to old age. I am very thankful indeed to have this privilege of coming back to this city to renew all these pleasant reminiscences of my college days, and to think over anew the aims and purposes that were instilled in me there, and that I have seen nurtured into the growth and advancement of this association to a degree almost beyond that of any other science. I am delighted again

to know that this progress has been largely made in its infancy, and its growth almost by the personal efforts of a large number of men who never lost sight of the duty which every man owes to his fellow man in public service, and so when we meet here to-day, and think these thoughts mingling in our minds with these recollections of our progress, we should indeed be a happy and contented body. We have lived a life of public service in the interests of our fellow men that commends our work not only to the people of our own country, where so much has been done for the advancement of our profession, but to all mankind, all over the world.

PRESIDENT MOHLER—I regret exceedingly to have to announce that owing to the serious illness of Mrs. Liautard, it was impossible for our honorary president to accept our invitation to honor us with his presence to-day. I am just in receipt of a cablegram, which I will take the liberty of reading.

CABLEGRAM FROM DR. LIAUTARD.

“Paris, France.

“*President, Veterinary Association, New York:*

“Your honorary president, between the sentimental duties that call him to America to-day, and those terribly sad duties of family which would not permit his presence with you on this great occasion, begs to be excused for his inevitable absence. He hopes that no one will blame him, and that among his friends they will find the excuse that he asks in exchange for the very warmest wishes that once again, perhaps the last, he sends to the veterinary profession of America.

“A. LIAUTARD.”

We have also received a letter from Prof. Liautard enclosing his presidential address, together with a personal request from him as follows:

“I trust that my address may be read by my sincere and distinguished friend, Dr. R. W. Ellis.”

I therefore take pleasure in introducing to you this morning Dr. R. W. Ellis, who will read the address which was sent over by Dr. Liautard.

DR. LIAUTARD'S ADDRESS.

*Mr. President, Ladies and Gentlemen, My Dear Confreres—*When two years ago I received from the President of the American Veterinary Medical Association the nomination of Honorary Chairman of your Committee of Arrangements to celebrate the 50th anniversary of the foundation of our National Association, and when later I was told by the Acting Chairman of said Committee that I was expected to address you on "The American Veterinary Medical Association," my heart was filled with great pride and an uncontrollable joy. Great pride to have been selected among so many of you, better acquainted with each other, and where one could be found, who would treat the subject in a far superior manner, with better words, but not more friendly feelings than I would. And a great joy, as at last the imperious necessity and obligations, the almost unavoidable necessity that I had watched and looked for since years, had at last come to me; namely, that of being once more among you, with all my professional friends, with so many of my boys.

Why then, am I not present on this occasion? Why then, instead of being here shaking your cordial hands, smiling at the pleasant recollections of happy days past, and celebrating with you this great day of the 50th anniversary of our national organization? Why am I not here?

There are in the life of a man obstacles that come against him, interfere with all his wishes, paralyze all his efforts, kill all his plans, no matter what he may do, no matter what his hopes have been, his desires, his good will may have planned, even when they have been prepared and entertained for years.

Such has been the case with me on this occasion. The great pride that your selection had awoke in me, will remain but the joy of a moment. I must be deprived of it, and leave it to make place for a very sad and deep disappointment.

Let me then beg of you to excuse me, and ask you to believe that it is with a heart full of regrets that I have to be away, and to permit me to hand to one of my friends among you my reply to the subject.

Let me do it now, and as I have heard that speakers would be allowed but a short time for occupying the floor, I shall be concise. Anyhow, it is said that short speeches are always the best. I will try to be brief.

Having the advantage, if it is one, of being the only original survivor present at the organization of our national institution,

with your kind permission, it will become me in replying to the subject, The American Veterinary Medical Association, to pass a concise review of her history. But in doing it, let me ask your indulgence. Fifty years is a good long lapse of time. Many events have occurred since. Our growth, our importance, the good that we have done, have increased as years have accumulated, and to speak of our origin and our progressive life, I have in my hands no official documents, almost no records. On my personal souvenirs I have to depend to tell how from a few we have come to be the home of all those who to-day compose the American Veterinary Medical Association. If I commit any errors, if I omit some specific mention, I hope they will be overlooked and put on the account of an over-fatigued and perhaps over-trained brain.

* * *

Gentlemen, the history of our grand Association can be divided into three periods. A first, beginning at its fundamental origin, involving birth, organization and early development. It extends from 1863 to 1889.

In a second, which dates from 1890, when it has reached the age of maturity, when she spreads her influence and manifests her growth, her importance, and reaches to 1898.

And a third stage, when in full development, when she has under her shelter, not only almost all the States of this great Republic, but adds to her active membership veterinarians from beyond her frontiers. Third period, which covers the time from 1898 to the present day.

In 1863, on the 9th day of June, a meeting was held in New York, in the old Astor House, in the lower part of Broadway.

This meeting had been called by the invitation of some veterinary practitioners of Philadelphia. In the old minute book of the Association will be found the first official reports of that meeting. As secretary, I had the honor to enter them.

At the Astor House there were represented only seven States: New York, Massachusetts, Pennsylvania, New Jersey, Delaware, Maine and Ohio. And among the gentlemen who were present and had the honor to form the organization, I may be allowed here to recall their names: From Pennsylvania, MacClure, Jennings, the two Raynor brothers, Mitchener; from New York, Doctor Large, A. S. Copeman, John Busteed, C. C. Grice and myself; from Delaware, Wisdom; from Maine, Flagg; from Ohio, J. C. Myers; from Massachusetts, Robert and C. M. Wood, William and Robert Saunders, Ripley, Thayer and Josiah H. Stickney.

I cannot remember who represented New Jersey. But anyhow the call had been acknowledged and properly answered.

The gentlemen present were all veterinary practitioners, with few regular graduates. The first were self-made men, but their love for their profession was made evident by the earnest way that they manifested in answering the call for the meeting, in its organization, as well as by the energy and the real professional manner with which they carried on the work expected of them. You must bear in mind that in those days there were no American regular graduates in the United States, and that only few foreign veterinary graduates were found here and there. The fact of their objects being successfully carried out by those self-made men, self-educated gentlemen in their most minute professional acts and conduct, speaks highly of their efforts in behalf of our profession.

The meeting at the Astor House was not, however, specially called for veterinarians, others were present, physicians, agriculturists and so forth, and on the first day the foundation stone being laid, on the second day the roll-call was signed by some forty gentlemen present. It is true that many dropped out after this call, but nevertheless the United States Veterinary Medical Association was born, was organized, its constitution carefully prepared, was adopted, a board of officers was elected, with Doctor Josiah H. Stickney, M.R.C.V.S., graduate of London, as president, and a seal with a motto unanimously adopted, which for years afterwards was applied on the certificates that were delivered to newly elected members. I do not know if it is to-day. The seal represented a centaur, the motto read, *Non Nobis Solum*.

When the meeting adjourned it was expected that the original plans would be carried out and that semi-annual meetings would be held in New York and Boston. The first being the annual in September, the latter in March.

These semi-annual reunions were held very regularly. The discussion of papers, the presentation of specimens of pathological interest, records of cases, consideration of subjects of value and importance from a professional point of view, and even some clinical work, occupied the time. And although the attendance was not always very large, the interest was never lacking, the enthusiasm remaining the same, and the object of the Association was never lost sight of, the earnestness and hopes of the members were always the same; namely, that the United States Veterinary Medical Association would one day become, par excellence, the bearer of the professional flag throughout the whole country!

And yet Boston and New York were the only places selected for the semi-annual meetings!

But times changed. The profession grew larger, schools had been opened and were bringing out regular graduates. They wanted to join and did join the Association. If at the beginning the Eastern States were principally prominent in the Association, others from the West had come, joined, and furnished many members.

A desire for greater magnitude was gradually manifested by all, and in remaining with the semi-annual meetings, as at the beginning, it seemed as if the U. S. V. M. Association was too confined; was, so to speak, limited, one sided, and her beneficial importance and influence arrested in their growth, and then having become of age, and reached her twenty-one years of good life, she made a grand effort, a valuable change, by deciding to hold thereafter the annual meetings in New York, and the semi-annuals in various cities in the country; and, following the advice of Horace Greeley's at that time popular saying, "To Go West," the U. S. V. M. Association went West, and held first an annual meeting in Cincinnati, which was followed successively by the semi-annuals of Philadelphia, Baltimore and Boston. In September, 1889, an annual gathering took place in Brooklyn.

Was there a semi-annual held after that? I have no recollection, no record of it. But I know well that at that time the Association had reached her 25 years, and that she had gathered under her wing nearly as many states, having indeed representatives from Massachusetts, New Jersey, Pennsylvania, Connecticut, Rhode Island, Virginia, Maryland, Ohio, Nebraska, Maine, South Carolina, Delaware, Kentucky, Michigan, Illinois, Indiana, Wisconsin, Missouri, Minnesota and South Dakota.

We are far from the day of organization and the work that the U. S. V. M. Association had to her credit, since the first meeting at the Astor House.

To review it, even concisely, would take too much time and wear out your patience. Think what you are to-day and judge of the difficulties she had to overcome!

With the large number of states represented in the membership of the Association, she had certainly realized her first object and become the national veterinary body of America. Here ends the first period of her existence.

* * *

Gentlemen, we are entering on the second stage of the life of the U. S. V. M. Association. If a little over twenty-five years

have been necessary for the raising and growth of the organization, the second period will cover less time. Of course, the hardest part of the work had been done. We are in 1890, at Chicago, when the 27th anniversary meeting was held. But although it was that of the U. S. V. M. Association, a greater name was in the minds, on the lips of many, it was a meeting of the great national association of the veterinarians of America, East and West, North and South. At that meeting we were then proud of our number, one hundred and twenty members having answered the roll call.

And then we went on and held the annual meetings in Washington in '91, Boston in '92, Chicago again in '93, for the Columbian Celebration, where the meeting was also called for the first International Congress of American Veterinarians. We went, in 1894, to Philadelphia, to Des Moines in '95, Buffalo in '96, Nashville in '97, and finally in '98 at Omaha.

During that period of eight years the semi-annual meetings were replaced by meetings of the Comitia Minora.

We have now arrived at the end of the second period of the life of the U. S. V. M. Association. As I have already said, it is not necessary, nor is it possible, to review the immense amount of good work that has been done, nor the enormous influence that the Association has had upon the elevation of our profession, the improvements in our colleges, the valuable changes, or how by her efforts and her will the education of veterinarians has been raised, extended and brought to the standing that it holds to-day. By the energy that she has deployed every branch connected with veterinary medicine has benefited, and all of us veterinarians can be proud of her. Read our professional journals, born of her bosom, and in them you will find recorded all her past doings, and tell me if she does not deserve well of our profession, and if we have not the right to look at her records with *fiercé*, with pride.

And now I must close these remarks. The U. S. V. M. Association is no more, she has changed her name?

* * *

The third period is now open!

We are in 1898, at Omaha! The old Association receives a second christening. She becomes the American Veterinary Medical Association of to-day.

Her history is but the continuation of her former life, and her membership is larger than that of any other similar body in the world. Her work is known, recognized and appreciated in

every scientific veterinary centre, for she will forever remain the solid representative of our profession in the new world. She has stretched her roots in every specialty of our branch of medicine. Civil practitioners, who look after the health of our domestic and pet animals, Agricultural Veterinarians, who look after the improvement of live stock and breeding; Army veterinarians; Sanitarians, who protect the health of our citizens; Milk Inspectors, who watch the food of our little ones; workers in their laboratories; Investigators of the Bureau of Animal Industry, everywhere the A. V. M. Association finds many of her worthy members.

It is true that some of our confrères are still laying off, they hesitate to join us, but let them have their time, make a little propaganda, and no doubt they will come if we only show them that the Association has proved and will always remain, true to her original motto, *Non Nobis Solum*—"Not For Us Alone."

Mr. President, ladies and gentlemen, in closing these remarks with my sincere thanks for your kindness for having listened so attentively, while I glance back over fifty years and think of those good pioneers of our profession that were there and now are gone, permit me to ask you to join me in wishing the everlasting and constantly growing grandeur of the American Veterinary Medical Association, and with the poet say:

"Let her live long and prosper,
And her shadow never grow less!"

PRESIDENT MOHLER'S ADDRESS.

Fellow Members of the Association and Friends—Through your kindness it has fallen to my lot to deliver the Presidential Address in a year which will always be conspicuous in the history of our association, and on a day which is intended to mark its semi-centennial anniversary. To have one's name enrolled amongst the 33 eminent men who have preceded me in this office is indeed an honor which naturally can come only to a few of the fourteen hundred who are numbered in this organization. At such a time our minds are necessarily occupied by thoughts of the past and of the future.

Fifty years ago there assembled in this city a coterie of loyal members of our profession who founded the United States Veterinary Medical Association. This meeting took place in 1863 in the midst of the disturbing influences coincident with the Civil

War, and was attended by a few veterinarians from each of seven states. Josiah Stickney was elected president and Alexander Liautard secretary. Of this loyal band of pioneers all save Liautard have passed from our activities, while he lives to-day to act as the honorary president on this birthday anniversary. It is given to few men to serve actively as a member of any organization for a period covering half a century, but this unusual experience characterizes the membership of our friend and colleague, Dr. Liautard, to whom we all extend greetings and best wishes on this natal day. The original meeting occurred on June 9 at the Astor House, when the nation was in the throes of civil strife and threatened dismemberment, and the armies of the North and the South were campaigning just prior to the great battle of Gettysburg. Yet in the midst of these frightful disasters, at a time when everything seemed in an irrevocable turmoil, there were found some indomitable veterinarians sufficiently resolute to brave the existing storm, sufficiently clear-sighted to prepare for the future. It was reserved for these men to be the first to conceive in wisdom and establish in strength an association qualified to meet successfully the purpose of the founders and to serve triumphantly as one of the pioneers of veterinary societies. Undeterred by the lack of numbers and unyielding to the clamor of radicalism, it has held fast consistently to a sane equilibrium and has demonstrated its merits by its survival. Remembering those who founded in wisdom and in faith and those who guided in loyalty and zeal, this glad half-century of consistent and successful endeavor is looked upon by us all with unstinted admiration. In a short time, thanks to the feverish activity of the corps of practitioners who carried on the youthful association, there grew up a strong sturdy organization. Meager as was the number of veterinarians who became charter members of this association, it doubtless was as great in proportion to the available men as is the greatly increased number of colleagues who now avail themselves of the opportunities here presented for securing membership in the leading veterinary association in the world. The growth of this association has been commensurate with the development of the nation. Its members have gone from its portals to take the lead in all movements for the development of veterinary science and its resources; they have been foremost in all actions having for their object the improvement of our profession and the betterment of animal life. And I doubt not that this great association will go steadily and grandly forward, keeping step with the onward march of human-

ity, broadening its work and increasing its usefulness throughout the years that are to come.

The acquirement of knowledge in the domain of animal diseases during the last 5 decades has been constant and amazing and compares favorably with the progress in other branches of science which has attracted the admiration of the world. As chemistry and physics have advanced from alchemy, and astronomy from astrology, so has veterinary medicine progressed from empiricism and become scientific. The most notable progress that has been made relates to the discovery of the class of infectious diseases and the mode of their conquest. As it is manifestly impossible in the time at my disposal to cover the details of development in all lines of veterinary medicine, it is deemed advisable to confine my remarks to the subject of infectious diseases, the study of which has done most to improve the health of domestic animals and at the same time to place our profession on a plane with the other learned sciences.

Coincident with the organization of the United States Veterinary Medical Association was the birth of our knowledge of pathogenic organisms, since the transmissibility of the anthrax bacillus by inoculation was discovered by Davaine in 1863. Two years later Villemin proved the infectiousness of tuberculosis and transmitted the disease from man to animals, while in 1867 Lister made his brilliant deduction that suppuration and septic processes in wounds were a species of fermentation which could be prevented by the use of germicides. The wonderful results of modern operative surgery have been made possible by the adoption of antiseptic and aseptic methods in the treatment of wounds and in the operating room. One of the most important contributions to the study of infectious diseases was the introduction of the "plating" method with solid culture media by Koch in 1881. Other discoveries which greatly aided the progress of this science were the adoption of the Abbe illuminating apparatus, immersion lenses, and aniline dyes for staining the bacteria. Beginning with the bacterium of chicken cholera discovered by Pasteur in 1880, a number of pathogenic bacteria were described during the ensuing years in rapid succession. The more important of these were the great discovery of the tubercle bacillus by Koch in 1882, Pasteur's researches on swine erysipelas in the same year, the isolation of the bacillus of glanders by Loeffler and Schutz in 1883, and the discovery of the tetanus bacillus by Nicolaier in 1884. From this date until 1892 few important discoveries were made, most of the

work done consisting in the perfection of the methods of investigation. However, the application of the newly gained knowledge concerning pathogenic bacteria to the prevention and cure of these diseases was begun almost immediately. What a revolution in veterinary thought and practice has resulted can be appreciated only by comparing the text-books of 25 years ago with those of the present day. Pasteur working on the theory that resistance to a disease could be produced by causing a mild attack of the affection, was able to produce immunity against a number of diseases of the lower animals. His classic experiments with anthrax vaccine are well known, as is also his method of protection against rabies by the use of an attenuated virus. Similarly we take pride in the pioneer work of two of our members, Salmon and Smith, who, in December, 1885, began a series of experiments, the results of which clearly established the principle that the injection of sterilized cultures or dead bacteria confers active immunity to subsequent inoculation with virulent materials. Here then was the beginning of the foundation upon which rests our present knowledge of vaccine therapy that to-day is attracting so much favorable attention both for preventing and healing disease. The priority of this successful accomplishment was duly recognized by Hueppe in his writings in 1888, although the students of Pasteur made claim to the honor. Their work, however, was not begun until the following March. The general application of this method to therapeutics must be accredited especially to Wright of London.

Another very important principle which is so intimately associated with the names of Salmon, Smith and Kilborne, was the determination of the cause of Texas fever and the method of its transmission through the agency of the cattle tick. It is of interest to note that this was the first experimental proof furnished on the subject of diseases borne by insects, or diseases that can be carried from one animal to another only by an intermediary host. This mode of transmitting infections has since become quite familiar to the public by the discovery that certain mosquitoes of different species spread malaria and yellow fever to man. Other insects—flies, ticks, lice and fleas—have been found to carry infectious diseases from one person or animal to another, and the future may show that insects play a most important part in diseases other than those of which we have present knowledge. The discovery of the plasmodia, piroplasmata and trypanosomes as causes of certain diseases of man and animals was the precursor of the enormous work which has been accom-

plished in establishing the relationship between various protozoa and diseases of man and animals. In 1903 Novy and McNeil succeeded in growing pathogenic protozoa in pure culture in a manner similar to the cultivation of bacteria. The discoveries of tuberculin in 1890 by Koch, mallein in the same year by Kelning, and tetanus and diphtheria antitoxin in the blood of animals injected with the toxins of these respective bacilli are additional milestones in the history of veterinary science. The specific etiology of many diseases of animals still remains unknown, while others have been only partially elucidated by the discovery of the filterability of their invisible causative agents. The first of these filterable viruses was discovered by Loeffler 15 years ago in the lymph of cattle affected with foot-and-mouth disease. At the present time 14 diseases of animals are known that are caused by this class of invisible organisms. One of these is on the verge of visibility—the organism of contagious pleuro-pneumonia. As a rule this class of infections confers a high degree of immunity which is permanent. In some instances, as in rinderpest and hog cholera, it has been possible to produce an actively immune animal without thereby causing severe disease, by injecting the virus and at the same time the corresponding immune serum. This principle of simultaneous injection of immune serum and virulent blood was evolved by Kolle and Turner for rinderpest in 1898 and by Dorset, McBryde and Niles for hog cholera in 1905.

It is encouraging to reflect that the progress of bacteriology, like the progress of this association, has been made by gradual and logical steps. The great discoveries, a few of the more important of which have been mentioned, were not lucky accidents, but were planned and studied with great patience and deliberation. Their number has ever grown, and hence a new branch of knowledge has become available for the prevention of disease. This knowledge is being utilized largely for the diagnosis of communicable maladies, and for the application of measures of protection which previously had been dependent solely upon the clinical symptoms of disease. With the study of methods of conferring the power of resistance to the invasion of pathogenic bacteria has grown the study of the processes of immunity. Such perfected methods are represented by the specific products which have reduced the dangers from rabies almost to zero, and the liability of tetanus after protective injections to a vanishing point.

New facts and conceptions of absorbing interest in immunity

studies have been disclosed in an abundance and with a rapidity which is simply bewildering. The later developments are so abstruse and complex as to daunt all but the most resolute inquirer. Though we are still hardly beyond the threshold of the problem, the results already attained have compelled us to recast our views as to the very nature of infection and its prevention. Theory after theory has arisen and then has been swept aside, not to disappear utterly, but to be melted in the crucible of research till the refuse was burnt away. In 1884 Metchnikoff first published his famous explanation of immunity by phagocytosis, while it seems but yesterday that the striking researches of von Behring bade fair to explain immunity in terms of antitoxin. Then Ehrlich developed his schematic studies of the "side-chain" theory, which, though brilliant, was only a working hypothesis. But the march of time has shown that they are only a part of the whole truth. In fact, the whirlpool into which these theories were leading us has been bridged by the recently developed theory of anti-ferments that appears to furnish us a more definite foundation for our explanation of immunity. We are still living within the era of its first achievements and therefore we may reasonably hope that this is merely the dawn of its beneficent results.

In proportion to our recognition of the fact that it is through ferments and toxins that bacteria exert their injurious power, the direction of research is changing and chemical examination is taking a large place in pathological inquiry. We now know that even when the actual bacteria have been destroyed by heat, the solutions containing them will produce toxic symptoms on injection in an animal or man. If the quantity is too small to produce serious symptoms it causes a reaction and anti-bodies are formed which counteract the effect of the living bacteria which are present or that may afterwards gain entrance. This power of producing immunity is now becoming of very great practical service. One finds to a certain extent the same anti-power in relation to ferments. The active digestive ferments in the intestinal canal are rendered inactive during their absorption through the intestinal walls.

During the last few years certain objections have been raised to Ehrlich's theory of immunity on the ground that the results obtained by experiments do not harmonize with the suggested hypothesis. Abderhalden has proved by his studies that enzymes or ferments present in the blood play an important part in the economy of the organism, not only from the true physiological

standpoint, but also from a pathological aspect. He shows that all the processes which are going on in the organism are of a chemical nature, but are governed by certain physical conditions of the body cells and their substrata from which they obtain their nourishment. The chemical changes produced are gradual, not abrupt, as usually supposed; and one or more enzymes take up the process of decomposition and synthesis where the other enzymes have ceased to be active. The actual processes noted in these changes are either reduction, oxidation or hydration. When considered in the light of immunity, it is seen that these chemical changes may be protective or destructive in nature. In this connection Abderhalden found that, after introducing certain foreign substances into the blood stream, enzymes were produced which acted specifically towards the foreign bodies. In other words, they destroyed or rendered them non-toxic. This shows a way in which the body protects itself against the invasion of foreign micro-organisms. He also proved that under certain physiological conditions, as pregnancy, the blood serum contains substances which are capable of hydrolizing the proteins of the placenta. Changes of a like character could also be noted in infectious diseases, such as tuberculosis and glanders and also in pernicious anemia of horses, while Rosenthal obtained the reaction in cases of carcinoma, nephritis and other diseases in man. The methods of noting the changes taking place are two, one which makes use of the polariscope in which the rotation of the serum of the subject when acting on a certain substrat is observed, and the other utilizes the process of dialysis. In the latter case the end products produced by the serum when exposed to a certain substrat are detected by a chemical reagent. These findings are enough to show that a certain equilibrium exists amongst the enzymes present in the organism under normal conditions, and when once this equilibrium is destroyed other enzymes or anti-enzymes are produced, or some of the enzymes present are increased in quantity.

Rothe and Bierbaum have recently published certain far-reaching results in the immunization of cattle with tubercle bacilli which appear to be of considerable importance to the study of immunity in tuberculosis. They aimed to find a method whereby larger amounts of tuberculous anti-bodies could be produced. For this purpose cattle were injected intravenously with variously treated tubercle bacilli and products thereof. A marked and prompt production of anti-bodies was noted which usually reached their height on the seventh day to persist into

the second month, when a pronounced diminution or even total disappearance would take place. Quite similar results were obtained in the case of horses also. Having established conclusively that anti-tuberculous substances can be produced, the effect of repeated intravenous injections of dead bacilli was tested and the results indicate that a considerable protection against virulent bacilli can be created by this method. Perhaps the most important result of this work, so far as immediate availability for practical use is concerned, is that by means of the serum of such animals, which is rich in tuberculous anti-bodies, it may become feasible to test the various tuberculins, of which such a large number are offered for sale, for their actual content in specific derivatives of tubercle bacilli, by means of test-tube methods. We long have needed some easily applied test of this kind, in order to exercise some control of commercial tuberculins, and it now seems that this may be possible.

The centre around which both human and veterinary science revolve is comparative pathology. Most of the diseases observed in man affect also domestic animals, and their course follows the same law. Comparison between constitutional and organic diseases of man and animals is already a means of widening the circle and adding to science. The work done in the domain of infectious diseases has shown how advantageous and even necessary is the co-operation of the veterinarian and the physician. These infections have been thoroughly studied by competent men belonging to both professions, and one of the principal factors in this union is the honest, conservative research work of many prominent representatives of our profession in all countries. In fact, the growth of veterinary medicine is intimately connected with the progress of human medicine. Hippocrates, Aristotle, Celsus and Galien recognized the advantages which could be derived from the comparison of the diseases of men and those of animals. While they practiced human medicine, they dissected animals, and from the observations they made, derived a better insight into the diseases of man. It may be correctly said that all that was at that time known of human pathology was taken from animals and applied to man. In the middle ages the epizootics and deaths among animals were ascribed to the influence of the stars, to the punishment of heaven, to sorcery or the Evil One. We can judge of the influence those ideas had on the people by what we see even in our day of such imaginary diseases as "Wolf-in-the-tail" and "Hollow-Horn." Then came the days when philosophical speculations were explained;

it was the time of dogmas. Then medicine became separate from surgery, and the latter being considered of inferior rank was consigned to the barber shops, while veterinary practice was referred to the blacksmiths. This state of affairs continued until the first half of the nineteenth century. Isolated from other sciences, veterinary medicine progressed slowly and contented itself with making sound practitioners. With the development of physical and natural sciences, veterinary medicine entered on new paths, and important discoveries were made. The erection of veterinary schools was becoming less infrequent, and by degrees a profession of skilled veterinarians was established, of which to-day we all feel proud.

One cannot contemplate the development of these veterinary institutions without a feeling of admiration in their achievements and a conviction that the phase of education which they typify is destined to become more and more important in America. The essential basis and foundation of a nation's welfare is to be found in its educational conditions. It is true that those abstract qualities which contribute to national greatness and patriotic citizenship are the offspring of ideals rather than of material things, but these can never come to their fullest fruition without that substantial foundation afforded by rational and well-balanced educational forces. Humboldt, the German philosopher, has truly declared that "whatever you put into the state, you must first put into the schools," and it is equally true that the standing of the veterinary profession is dependent on the strength of its schools.

No one factor has been more successful in elevating the standard of veterinary institutions in America than the investigation of their curricula and equipment by the Bureau of Animal Industry in conjunction with the U. S. Civil Service Commission. While the primary object of such supervision was to make it possible for the Government to obtain men better educated and better qualified for its veterinary work, it nevertheless succeeded in raising the standard of veterinary education in the United States and enabled the students to obtain greater and better facilities for study. These schools have made large expenditures of money and have greatly augmented and improved their facilities. The Government had previously taken an active part in helping to improve veterinary education. When in 1894 the veterinary inspectors of the Bureau were placed in the classified service, it was necessary for applicants to be graduates of veterinary colleges. In 1899 a step in advance was taken when

it was demanded that the graduate should be from a college having a course of not less than 3 years. Six months later this was changed to refer to graduates after 1897, while those before this date were eligible if from a 2-year college. In 1903 a further stipulation was made to the effect that graduates from a college having a 3-year course must have spent at least 2 years in the study of veterinary science. This prevented the colleges from giving two years' credit to students from agricultural, medical, dental and other colleges.

This association likewise has been an aggressive factor in improving educational facilities in our colleges. Prior to January 1, 1893, it was possible for graduates of 2-year schools to become members of this association, but at that time the barrier was placed so that it was necessary for applicants to have graduated from a 3-year school, having at least four veterinarians on the faculty. However, the 2-year graduates of any school which adopted the 3-year course could qualify, provided they had been five years in actual practice. During the last two years the association has had a committee on veterinary colleges at work inspecting and investigating the matriculation and course of studies in these veterinary colleges with an appropriation for expenses, and the results have well repaid the time and money expended. The various committees on intelligence and education have likewise given this subject faithful consideration, but systematic visitations of the schools were never undertaken. Another potent agency in the advance of veterinary teaching may be found in the establishment of the State Boards of Veterinary Examiners. These boards, which have been created in almost all the states, have set standards which have forced the colleges to meet them. The entrance examination now required by our schools is another factor in improving veterinary education by securing a better class of students who are more able to comprehend the various studies in the course.

Veterinary science will always be subject to reversals. Its progress has been and always will be a series of advances and retrogressions with the outposts of knowledge steadily advancing. All this but emphasizes the supreme importance of organizing inquiry on a thorough-going basis, coupled with a judicious conservatism in the formulation of conclusions. The broader and more tributary the field over which the collection of details is extended, the more certain is the scientific worth of the results obtained.

A lack of training in the fundamental principles is evidenced

in the results from time to time reported of research work or investigations, as pursued by observers thus disqualified for the task which they have undertaken. Eternal warfare between truth and error is a record of the conflicts between knowledge and ignorance—conflicts that are oftentimes intensified by the inclusion of the personal element, leading to conditions that further complicate the problem and overshadow the main issue until all recognition of its importance is lost. But there is an important mitigating factor affecting the case of the man who, with the courage of his ignorance, vehemently asserts that he knows. This factor is the honesty of his belief in the evidence of what he calls his own experience and his faith that what he himself has experienced cannot be wrong. It is, however, just that kind of faith that is earliest destroyed by systematic training in precise methods of scientific observations and reasoning. Research, so called, has been carried to an absurd excess by men who have ventured alone into the scientific jungles with the hope of finding something, but without definite aim or fundamental knowledge or landmarks. It would seem advisable that no apparent discovery, made by a man who has not established a scientific status, should be accepted as such without a trial by a commission composed of scientists of established reputation.

It is quite generally conceded that the value of scientific discoveries and deductions is dependent upon their authorship. When new results are brought to our attention, the first inquiry is for the name of the author, and several factors enter into our judgment of his work. These are (1) his personal equipment; (2) his motive, and (3) his environment. The primary consideration is the man. Unripe minds will naturally produce pseudo-science, and much so-called science is being forced upon our attention to-day that is unripe, undigested. The personal side of research must begin with the proper training and preparation to conduct research that is worthy of the name, and until we find the man fitted for this work, such accessories as money, equipment, apparatus, etc., cannot be efficiently applied. As an illustration of my theme that great things have been accomplished in the smallest quarters with primitive facilities, it may be interesting to know that the best research work accomplished by Prof. Ostertag was in a reconstructed hot-house, while Theobald Smith's renowned work on Texas fever was carried on in a poorly equipped garret of a four-story building. The goddess of science donates her treasures mostly to those who desire them for their own sake, and not for the sake of the riches they may

bring. In these days of money-making invention we need a renaissance of the spirit which inspired and upheld the fathers of our profession in their strenuous labors, both scientific and practical, that have laid the foundations of modern veterinary medicine.

Professionally, we guard the greatest income-producing property in both the United States and Canada. Few appreciate the vast investment which we have in these countries in domesticated animals. There are, I believe, not less than five billions of dollars invested in the various kinds of domesticated animals in the United States, and on every side this vast investment is threatened by pestilence and disease. In fact, government statistics will show that the loss of farm animals last year in this country alone comprised over 6½ million swine, nearly 2 million cattle, over 2½ million sheep, and more than half a million horses and mules—the total value exceeding two hundred millions of dollars. And it is the universal opinion of competent men who make a study of this subject that a large proportion of this loss can be eliminated by judicious sanitary measures. The greatest mortality is among swine. Something like nine-tenths of that is due to hog cholera; and cholera, though not absolutely preventable at present, can be very greatly reduced by judicious application of serum, together with proper sanitary control. The improvement and the protection of such interests as these are worthy of the most earnest consideration of both statesmen and scientists. This association is working not only for the alleviation of the suffering and loss of domesticated animals, but also for the protection of the public health. We have in view both of these problems, and there are many diseases which we are investigating and endeavoring to control, the suppression of which will mean as much to the human race as it does to dumb creation, for which we are the especial guardians. Until recently our meat supply was ample with some to spare. Only six years ago we exported from the United States half a million cattle, and over four hundred million pounds of beef. Now exports have almost ceased, principally because of the home demand. We have only 23 cattle to the square mile, while Belgium has 164 and Denmark 144. However, any such intensive scheme of beef production is bound to be more expensive than the former methods of raising cattle on the vast grass-lands of the open range. But some compensation may be had by saving even a part of the yearly preventable waste of food animals and thereby reducing the problem of high prices, for the consumer finally

pays for the loss of animals that perish from disease, as well as for the healthy animals which are used for food.

A review of American veterinary progress would not be complete without some mention of the achievements of two Government bureaus that are under veterinary direction and the activities of which are largely in the domain of veterinary science—the Canadian Health of Animals Branch and the United States Bureau of Animal Industry. In the relatively short periods of their existence these organizations have made a remarkable record, both in scientific research and in the administrative application of scientific knowledge and have thus thrown luster on the veterinary profession.

Veterinarians have always constituted a large proportion of the force of their employees, and at present in the Bureau of Animal Industry alone they number 993.

If the scientific staff of the Bureau of Animal Industry had never done anything more than to make the classic discovery of the mode of transmission of Texas fever by the cattle tick, the bureau's existence would have been amply worth while. This discovery established a new principle in medical science, the extent of the application of which the world is only beginning to realize as we learn to conquer in turn such maladies as yellow fever, malaria and sleeping sickness. It has made possible such triumphs of sanitary science as have been accomplished on the Isthmus of Panama, and without which the great canal could not have been constructed so expeditiously and with so little loss of human life.

In the prevention and eradication of animal diseases the bureau has been of the greatest economic service. On several occasions it has saved the live-stock industry of the country from disaster and ruin. The immediate cause of the organization of the bureau was the presence of contagious pleuro-pneumonia of cattle, which had been introduced in some way from abroad and, becoming established in the eastern states, had spread as far west as Illinois. It was only after several years of effort that this insidious and stubborn disease was completely stamped out, and it has not since reappeared.

Twice the bureau has had to deal with outbreaks of foot-and-mouth disease, first in New England, and later in some of the eastern and middle western states. Each time the disease was conquered after prompt and vigorous work by a well-organized force of trained veterinarians and assistants. Even when we consider the experience of European countries that have struggled

in vain for many years to get rid of this malady, it is difficult for us to appreciate the value of the work which prevented this infection from becoming established in this country and from spreading to the great stock-raising regions of the West. In studying the origin of the latest outbreak, it was found that the infection was due to contaminated imported vaccine virus, and an interesting case of symbiosis of vaccinia and foot-and-mouth disease was discovered and demonstrated.

For many years the presence of cattle ticks and the infection of Texas fever have made it necessary to maintain a quarantine on cattle in a large area in the southern part of the United States. The movement of these cattle to northern markets has been permitted only under restrictions which entailed expense and lowered prices. The disease was a great disadvantage to the infected region and prevented the development of cattle raising there. The losses and damage have been variously estimated at from \$40,000,000 to \$200,000,000 a year. Applying the knowledge gained as to the nature of the disease, the life history and habits of the ticks and methods for their destruction, the bureau with local help has during the past seven years waged a highly successful warfare of extermination against the ticks. The territory freed of infection in this time now amounts to nearly 200,000 square miles and almost equals in extent the combined areas of Tennessee, Georgia, Alabama and Mississippi. More than one-fourth of the territory originally infected has now been cleared, and we may look forward to the time when a great section of our country, naturally suited to cattle raising, will do its part toward supplying beef to feed our growing population.

Armed with an effective weapon against hog cholera in the preventive serum already mentioned, the bureau has given battle to this disease, which for so many years has wrought havoc to the hog raiser. Systematic work has been started, and with the experience of previous conquests it is not too much to hope that in time this work will also meet with success.

In tuberculosis we have the greatest problem that confronts veterinary officials. In the research work leading up to our present knowledge of this plague of animals and man, the veterinary profession has had a most creditable part, and the Bureau of Animal Industry has made valuable contributions to this knowledge. The task before us is to adopt administrative means which will repress and, if possible, eventually eradicate this disease from our domestic animals. The successful control of cattle mange, sheep scab, dourine and other infections are examples of similar veterinary achievements.

The United States Meat Inspection Service constitutes the largest piece of veterinary administrative work in the world. Inspection is maintained at 786 establishments in 222 cities and towns, requiring the services of about 2,500 employees, including a large proportion of veterinarians, who make all final decisions on post mortem. A high standard of efficiency obtains, and the results compare favorably with the service in other countries. It is interesting to note that in the attacks of 1906 no fault was found in any case with the veterinary work.

Taken as a whole, the large number of employees constituting the great administrative body of the Bureau of Animal Industry are a conscientious and efficient force of men who deserve well of both the profession and the public, whose welfare they constantly guard. In their loyalty to the former they are necessarily loyal to the latter, for their interests are inseparable.

By research and educational propaganda the bureau has been a strong element in the general improvement in milk. The adoption of the score-card system of inspection and the advocacy of pasteurization at 145° for 30 minutes, which does not injure the nutritive or digestive qualities of the milk, have been important factors in milk sanitation.

In these and many other ways the bureau has given the world valuable scientific knowledge, has benefited humanity, protected health, performed economic service to stock-raising interests and reflected credit on the veterinary profession.

The increasing use of sera and vaccines in veterinary practice has made it desirable to obtain federal and state legislation, in order to supervise the preparation of such products. Biological remedies have an important place in the field of sanitary medicine, and this field is constantly becoming larger and more important. Some of these products, however, have been found to be frauds and a menace to the live-stock industry. It is, therefore, with much pleasure that I report the recent passage of bills regulating the sale of these products by the states of Alabama, Georgia, Pennsylvania and by the Congress of the United States. In Europe these products are prepared by private firms under state control as in Germany, or they are manufactured by the government itself as in Holland. In the latter instance legislative measures are unnecessary.

That there is a promising future for this most recent branch of therapeutics may be frankly admitted, but there is a risk of allowing enthusiasm to outrun discretion in the claims which the advocates of these products urge in their favor.

It has been stated that the veterinarian of the future will be an immunologist. We all agree in hoping that it may be in his power to afford immunity to his patients from as many diseases as possible. But I submit that he must continue to be in the future as he has been in the past, above all things a man of wide clinical experience. No matter how great the advance of science may be in the future, there never will be a royal road to veterinary medicine. It will be the common road that all must tread who aspire to treat disease, and after the class-room has been left behind it will be through the stable, the farm, or the ranch, the post-mortem field, and the clinical laboratory and will always lead back to the side of the diseased animal.

During the past year the spirit of our members and the energetic team work of the officers and committees of the association were highly commendable, and I wish to express my sincere appreciation of their valued services. I cannot refrain from mentioning especially the aid I received from our painstaking secretary and the indefatigable labors of the chairman of the legislative and publication committee. I have kept in close touch with the activities of the various committees, and I trust that their recommendations will be given careful consideration by the executive committee. The assignment of certain lines of work and investigation to special committees is an admirable arrangement, and I hope that this method of apportioning the problems of the association will be even further extended in the future. I do not deem it necessary to make any specific recommendations at this time, as I am satisfied that you will give your earnest consideration to all matters which will be brought before you during the meeting, and in passing judgment on the different aspects of the subject you will always be guided by motives which will be for the benefit of our association and the welfare of our profession.

I fain would speak of many other matters, but I have been warned not to trespass on your patience by speaking at too great length, and the warning is full of wisdom. However, before closing my address, it is fitting that I should pause, if only for a moment, to call to mind with affection and reverence those great men who honored and delighted this association for years and who have conferred such high distinction upon the position of the veterinarian. I refer to men like Stickney, Michener, Large, Miller, the Rayner brothers, Andrew Smith, Huidekoper, Clement, Roscoe Bell, Pearson, Harger, Dougherty and many others. With what amazing industry, versatility and keenness

of intellect did they unfalteringly cultivate the field of veterinary science! With what devotion and beneficial results did they give their time and abundant knowledge to the service of the public and of our profession! To-day we mourn their loss, but rejoice in the rich fruitage of their past friendship.

From the history of veterinary medicine let veterinarians draw confidence in the invincible strength of their science, which, though at one time despised even by the well-informed, has during the last five decades attained such great importance and such wide influence in the life of this and other countries. And let them take fresh courage and make new resolutions to rival all the other professions in useful work to be accomplished in the 50 years to come. Let them also remember with gratitude and veneration those not of our profession who, supervising veterinary sanitation, early recognized the value of such control work and aided in its organization.

To-day far-reaching questions of great importance are agitating the association. Whatever the outcome, let us hope that this, the greatest association the members of our profession have ever seen, may in no measure depart from the high traditions it has ever set before it, but rather increase its usefulness to the profession and to the public.

Gentlemen, I have no fear for the future of veterinary medicine. I have an equally confident belief that in the times to come those who practice it will be held in increasing honor, and of him who is faithful to its high traditions it will be said, "Many shall commend his understanding."

THE ATTENDANCE.

MEMBERS.

Francis Abele, Jr., Quincy, Mass.
E. B. Ackerman, 265 Greene avenue, Brooklyn.
John Wm. Adams, Philadelphia, Pa.
J. P. Aikenhead, Easton, Md.
F. W. Andrews, Mt. Kisco, N. Y.
John B. Archer, Spencer, Ind.
R. A. Archibald, 2434 Webster street, Oakland, Cal.
Samuel Atchison, 987 Herkimer street, Brooklyn, N. Y.
Geo. F. Babb, Topeka, Kan.
A. H. Baker, 2537 State street, Chicago, Ill.
S. S. Baker, Chicago, Ill.
Jos. F. Barnes, 1715 Broadway, Toledo, Ohio.
Harry E. Bates, So. Norwalk, Conn.
A. E. Behnke, Milwaukee, Wis., Care of Bureau Animal Industry.
E. W. Babson, Gloucester, Mass.
M. C. Baker, 194 Milton street, Montreal, Canada.

- Chas. J. Becker, Stevenson, Ala.
H. E. Bemis, Ames, Ia.
Geo. H. Berns, 74 Adams street, Brooklyn, N. Y.
H. D. Bergman, Ames, Ia.
W. Reid Blair, New York City.
Thomas Bland, Waterbury, Conn.
J. H. Blattenberg, Lima, O.
Alfred F. Bollinger, 2218 Albemarle road, Brooklyn, N. Y.
F. A. Bolser, New Castle, Ind.
O. L. Boor, Muncie, Ind.
Chas. W. Boyd, Pittsburgh, Pa.
H. W. Boyd, Nyack, N. Y.
F. F. Brown, Kansas City, Mo.
P. H. Browning, San Jose, Cal.
S. E. Bruner, Greensburg, Pa.
D. V. Buckingham, 2115 14th st., Washington, D. C.
S. H. Burnett, Ithaca, New York.
Frank P. Devine, Yonkers, N. Y.
J. F. De Vine, Goshen, N. Y.
M. W. Drake, 1308 Morris street, Philadelphia, Pa.
Henry W. Dustan, Morristown, N. J.
George W. Dunphy, Quincy, Mich.
O. E. Dyson, 4201 Halsted street, Chicago, Ill.
R. F. Eagle, Chicago, Ill.
John D. Fair, Millersburg, Ohio.
A. M. Farrington, 1436 Chapin st., Washington, D. C.
David F. Fox, Sacramento, Cal.
Charles T. Frey, River Point, R. I.
Adolph Eichhorn, Department of Agriculture, Washington, D. C.
Robert W. Ellis, 509 West 152d st., New York City.
Pierre A. Fish, Ithaca, N. Y.
C. P. Fitch, Ithaca, N. Y.
D. B. Fitzpatrick, 3225 Woodland ave., Philadelphia, Pa.
Otto Faust, Poughkeepsie, N. Y.
M. V. Gallivan, Lethbridge, Alberta.
James T. Glennon, 27 Clay st., Newark, N. J.
Harry D. Gill, New York City.
Ward Giltner, East Lansing, Mich.
E. A. A. Grange, Ontario Veterinary College, Toronto, Canada.
J. O. Greeson, Kokomo, Ind.
John W. Grover, Hamilton, Ontario, Canada.
E. Hanshew, 125 and 127 Carlton avenue, New York, N. Y.
Wm. Hansen, 511 North Lafayette street, Greenville, Mich.
C. M. Haring, Col. of Agriculture, Berkeley, Cal.
William J. Hennessey, 126 Front street, Worcester, Mass.
Jacob Helmer, Scranton, Pa.
L. J. Herring, Wilson, N. C.
Charles H. Higgins, Ottawa, Canada.
R. W. Hickman, Washington, D. C.
Will. A. Hilliard, Room 114, 352½ Portage avenue, Winnipeg, Manitoba, Canada.
J. B. Hollingsworth, 105 Cambridge street, Ottawa, Ontario.
John B. Hopper, Ridgewood, N. J.
W. Horace Hoskins, 3452 Ludlow street, Philadelphia.
Herbert Hoope, Bel Air, Md.
Joseph Hughes, Chicago, Ill.
Frank Hunt, Jamestown, N. Y.
Wilson Huff, Rome, N. Y.
Arthur S. Houchin, Newark, Del.

J. H. Jacobus, New York.
J. Payne Lowe, Passaic, N. J.
Richard P. Lyman, East Lansing, Mich.
William H. Lytle, Salem, Oregon.
F. H. McCarthy, Pottsville, Pa.
D. McCuaig, McAdams Junction, N. B.
C. D. McGilvray, Winnipeg, Canada.
Benj. McInnes, Charleston, S. C.
David McGibbin, Jr., 2900 Frankford avenue, Philadelphia, Pa.
W. J. McKinney, 124 Lee avenue, Brooklyn, N. Y.
Geo. B. McKillip, Chicago, Ill.
R. D. Macintosh, 3 Temple street, Toronto.
Robt. S. MacKellar, 351 West 11th street, New York, N. Y.
Frank H. Mackie, Baltimore, Md.
Thos. E. Maloney, Fall River, Mass.
D. J. Mangan, 280 East 162d street, New York City.
C. J. Marshall, Philadelphia, Pa.
L. A. Merillat, 1827 Wabash avenue, Chicago, Ill.
George W. Meyer, 528 Washington street, New York City.
J. C. Meyer, Cincinnati, Ohio.
H. J. Milks, 113 College avenue, Ithaca, N. Y.
F. A. Miller, 37 Day street, Fitchburg, Mass.
A. D. Miller, 190 West Lane avenue, Columbus, Ohio.
J. R. Mohler, Washington, D. C.
A. E. Moore, Ottawa, Canada.
V. A. Moore, Ithaca, N. Y.
Hamlet Moore, New Orleans, La.
H. S. Murphy, Ames, Iowa.
P. F. Murphy, Philadelphia, Pa.
Thos. J. Herr, 331 East 83d street, New York City.
W. M. Burson, Athens, Ga.
Edw. A. Cahill, Canonsburg, Pa.
D. M. Campbell, 1761 Lawrence avenue, Chicago, Ill.
C. A. Cary, Auburn, Ala.
C. H. Case, Akron, Ohio.
F. W. Chamberlain, East Lansing, Mich.
R. R. Clark, Hampton, Va.
W. J. Coates, 141 West 54th street, New York City.
David W. Cochran, 120 West 12th street, New York City.
Charles E. Cotton, Minneapolis, Minn.
A. S. Cooley, 2050 East 79th street, Cleveland, Ohio.
J. M. Cooper, Cincinnati, Ohio.
Charles L. Colton, Hartford, Ct.
H. B. Cox, 1516 Snyder avenue, Philadelphia.
W. B. Craig, Indianapolis, Ind.
W. H. Dalrymple, Baton Rouge, La.
B. F. Davis, Cheyenne, Wyoming.
L. Enos Day, Chicago, Ill.
Robert Dickson, Fairhaven, N. J.
F. J. Douglass, New Orleans, La.
J. S. Donald, Bay City, Mich.
W. H. Dodge, Leominster, Mass.
T. E. Jago, Athens, Ga.
M. Jacob, Knoxville, Tenn.
H. Jensen, Kansas City, Mo.
A. Joly, Waterville, Maine.
P. K. Jones, Pittsburgh, Pa.
P. T. Keeley, Waterbury, Conn.
J. A. Kiernan, Nashville, Tenn.

- R. H. Kingston, 41 Convent avenue, New York City.
A. T. Kinsley, Kansas City, Mo.
Louis A. Klein, Philadelphia, Pa.
A. C. Knapp, Bridgeport, Conn.
Valentine M. Knapp, 37 New street, Danbury, Conn.
Ralph V. Knight, Olean, N. Y.
A. D. Knowles, Livingston, Mont.
Theodore F. Krey, Detroit, Mich.
Oscar Kron, San Francisco, Cal.
G. Ed. Leech, Winona, Minn.
Charles Linch, Albany, N. Y.
Wm. Herbert Lowe, Paterson, N. J.
J. T. Nattress, Delavan, Ill.
John V. Newton, Toledo, Ohio.
Herbert F. Palmer, 202 North 50th street, Philadelphia, Pa.
H. D. Paxson, 3621 Indiana avenue, Chicago, Ill.
C. D. Pearce, 10 Carhart avenue, Binghamton, N. Y.
L. A. Paquinn, Webster, Mass.
Harrie W. Peirce, 19 South street, Medford, Mass.
Benj. D. Pierce, Springfield, Mass.
Charles H. Perry, Worcester, Mass.
A. T. Peters, Springfield, Ill.
J. S. Pollard, Providence, R. I.
G. M. Potter, Washington, D. C., E. A. I.
M. M. Poucher, 137 West 3d street, Oswego, N. Y.
W. Runge, Newark, N. J.
Edward Rafter, Hamburg, N. Y.
S. V. Ramsey, Sr., Terre Haute, Ind.
E. M. Ranck, Agricultural College, Mississippi.
John Reichel, Glenolden, Pa.
M. H. Reynolds, St. Paul, Minn., University Farm.
T. H. Rich, Burlington, Vt.
Roy. Riddle, Norwich, Ont., Can.
W. H. Ridge, Trevoise, Pa.
G. A. Roberts, North Raleigh, N. C.
James Robertson, 735 East 44th street, Chicago, Ill.
T. E. Robinson, Westerly, R. I.
H. B. Ropp, Ashland, Ohio.
Jacob G. Pfersick, 3 Leonard street, Greenfield, Mass.
G. H. Roberts, Indianapolis, Ind.
John F. Ryan, 2525 Indiana avenue, Chicago, Ill.
J. E. Ryder, 235 East 92d street, New York, N. Y.
F. S. Schoenleber, Manhattan, Kan.
Charles L. Schloemer, Hoboken, N. J.
J. W. Scheibler, 271 Court avenue, Memphis, Tenn.
Fred. H. Schneider, York road and Erie avenue, Philadelphia.
E. C. Schroeder, Bethesda, Md.
Oscar Schreck, New Haven, Conn.
J. W. Sallade, Auburn, Pa.
C. E. Shaw, 115 Sterling place, Brooklyn, N. Y.
J. T. Seely, Seattle, Wash.
Edgar H. Shepard, 2027 East 105th street, Cleveland, Ohio.
R. E. Shigley, Kenmare, N. Dak.
T. A. Sigler, Greencastle, Ind.
W. M. Simpson, Malden, Mass.
Alex. Slawson, 47 West 39th street, New York City.
James Smellie, Eureka, Ill.
Thomas E. Smith, 309 Barrow street, Jersey City, N. J.
H. E. States, Detroit, Mich.

- R. M. Staley, Harrisburg, Pa.
S. Stewart, Kansas City, Mo.
G. T. Stone, Norwich, N. Y.
J. B. Thompson, New York.
C. H. Taylor, De Kalb, Ill.
Thos. Thacker, Renfrew, Ont., Canada.
F. Torrance, Ottawa.
J. Traum, Washington, D. C.
A. Trickett, Kansas City Veterinary College, Kansas City, Mo.
H. W. Turner, New Hope, Pa.
John P. Turner, 918 O street Northwest, Washington, D. C.
Geo. B. Vliet, Hackettstown, N. J.
E. A. Watson, Veterinary Research Lab., Lethridge, Alberta, Canada.
S. H. Ward, St. Paul, Minn.
W. B. Washburn, Tiffin, O.
Guy N. Welch, Northfield, Vt.
George F. Wescott, Portland, Me.
David S. White, Columbus, O.
John L. White, 5327 Union avenue, Chicago, Ill.
Geo. R. White, Nashville, Tenn.
W. E. Wight, 237 McKee place, Pittsburgh, Pa.
E. J. Will, Harrisonburg, Vt.
W. L. Williams, Ithaca, N. Y.
R. H. Wilson, Rochester, Mich.
J. F. Winchester, Lawrence, Mass.
B. T. Woodward, Washington, D. C.
E. H. Yunker, Philadelphia, Pa.
W. A. Axby, Harrison, Ohio.
H. H. Bear, Mt. Joy, Pa.
E. M. Bronson, Indianapolis, Ind.
F. W. Caldwell, St. Joseph, Mo.
U. S. G. Bieber, Kutztown, Pa.
H. P. Bolich, Ashland, Pa.
C. R. Bodren, Taunton, Mass.
Chas. S. Chase, Bay Shore, N. Y.
Henry Cady, Gloversville, N. Y.
Thos. Castor, Philadelphia.
E. L. Cornman, Marietta, Pa.
J. J. Connell, Clarksburg, W. Va.
M. J. Curran, 39 North 6th street, New Bedford, Mass.
C. C. Dauber, Sturgis, Mich.
H. F. Eckert, Markesan, Wis.
O. H. Eliason, Madison, Wis.
A. A. Etienne, 67 Drummond street, Montreal, Province of Quebec, Canada.
H. P. Eves, Wilmington, Del.
Frank U. Fernsler, Lebanon, Pa.
Paul Fischer, Columbus, Ohio.
William Gall, Matawan, N. J.
Carl W. Gay, Swarthmore, Pa.
G. D. Gibson, Adrian, Mich.
S. H. Gilliland, Marietta, Pa.
J. T. Glennon, Newark, N. J.
Joseph P. Grogan, 901 Ashland avenue, Baltimore, Md.
R. C. Gross, Elizabethtown, Pa.
W. A. Haines, Bristol, Pa.
Herbert F. Harms, Pearl River, N. Y.
W. F. Harrison, 329 Broad street, Bloomfield, N. J.
W. B. Holmes, Springfield, Ill.

- T. Jos. N. Hornbaker, Front Royal, Va.
G. A. Johnson, Exchange Building, Sioux City, Iowa.
R. L. Kann, Mechanicsburg, Pa.
H. B. Langdon, Charlestown, W. Va.
Chas. G. Lamb, Denver, Colo.
Frank E. Lentz, 39th street and Woodland avenue, Philadelphia.
G. W. Loveland, Torrington, Conn.
Thos. Kelly, Philadelphia, Pa.
Jas. McDonough, Montclair, N. J.
N. S. Mayo, Blacksburg, Va.
D. S. Miller, Philadelphia, Pa.
John M. Miller, Grand Rapids, Mich.
R. Moody, Maysville, Ky.
T. E. Munce, Harrisburg, Pa.
W. F. Myers, Fort Wayne, Ind.
E. W. Newcomer, Mt. Joy, N. J.
H. D. Pattison, Beloit, Wis.
M. P. Ravenel, Madison, Wis.
Edgar W. Powell, Bryn Mawr, Pa.
W. T. Pugh, Southbridge, Mass.
Edward Records, Glenolden, Pa.
J. H. Roberts, 64 King street, Northampton, Mass.
E. F. Sanford, 115 Sterling place, Brooklyn, N. Y.
L. A. Severcool, Elyria, Ohio.
C. W. Shaw, 200 West 78th street, New York City.
Thos. Sheldon, Rhinebeck, N. Y.
C. S. Shore, Lake City, Minn.
C. J. Sihler, 649 Everett avenue, Kansas City, Kans.
W. J. Schumaker, 56 East 87th street, New York.
Geo. H. Smith, 213 7th street, Hoboken, N. J.
Albert N. Towne, Brewster, N. Y.
J. P. West, Madison, Wis.
J. G. Whiting, Montpelier, Vt.
A. G. Wicks, Schenectady, N. Y.
J. G. Wills, Albany, N. Y.
J. W. Young, 419 6th street, Brooklyn, N. Y.
L. J. Belloff, 222 George street, New Brunswick, N. J.
Adolf Berg, Doylestown, Pa.
R. W. Carter, Johnstown, N. J.
J. Elliott Crawford, Far Rockaway, N. Y.
Frank P. Dorian, 35 Franklin street, Yonkers, N. Y.
J. F. Deveraux, Waterbury, Conn.
Thos. Fraser, 316 North Henry street, Richmond, Va.
A. T. Gilyard, Waterbury, Conn.
James Graham, 115 Queen lane, Philadelphia, Pa.
J. L. Halloran, Stapleton, Staten Island, N. Y.
W. G. Hollingworth, 54 Lafayette avenue, Utica, N. Y.
C. M. Hoskins, Philadelphia.
Lester H. Howard, 187 Huntington avenue, Boston, Mass.
Fredric S. Jones, 11 Claverly place, Flushing, Long Island.
Geo. B. Jones, Sidell, Ill.
Wm. Henry Kelly, Albany, N. Y.
D. R. Kensey, Danbury, Conn.
E. F. Koehler, Easton, Pa.
A. J. McCloskey, Philadelphia, Pa.
J. A. McCloskey, Philadelphia, Pa.
Rudolph F. Meiners, Boonton, N. J.
H. K. Miller, Mamaroneck, N. Y.
John F. Miller, Albany, N. Y.

F. E. Palmer, Owatonna, Minn.
 C. E. Poe, Hagerstown, Md.
 R. M. Quigley, Tyrone, Pa.
 W. L. Rhoads, Lansdowne, Pa.
 Geo. H. Roberts, Indianapolis, Ind.
 H. R. Schwarze, Springfield, Ill.
 B. F. Senseman, Philadelphia.
 A. B. Sexmith, Charlotte, Mich.
 C. A. Schauler, 1338 Hunting Park avenue.
 R. V. Smith, Frederick, Md.
 Mulford C. Thompson, Sharon, Conn.
 R. S. Todd, New Milford, Conn.
 Wallace F. Vail, Greenwich, Conn.
 Andrew G. Vogt, 323 Belleville avenue, Newark, N. J.
 D. Warnock, Pincher Creek, Alta, Canada.
 Cassius Way, Harvard, Ill.
 J. M. Armstrong, Providence, R. I.
 S. Brenton, Detroit, Mich.
 T. S. Carlisle, Chestnut Hill, Philadelphia, Pa.
 W. G. Chrisman, Blacksburg, Va.
 David B. Comstock, Albany, N. Y.
 W. E. Cotton, 3242 38th street N. W., Washington, D. C. Hotel Bristol.
 A. L. Danforth, Goshen, N. Y.
 J. D. De Ronde, 72 E. 82d street, New York City.
 E. C. Deubler, Malvern, Pa.
 E. S. Deubler, Marberth, Pa.
 James G. Ferneyhough, Burkeville, Va.
 John J. Graham, 115 Queen lane, Germantown, Philadelphia, Pa.
 Charles E. Hershey, Tiffin, Ohio.
 J. Huebschmann, Baltimore, Md.
 J. Huelson, 76 Montgomery street, Jersey City, N. J.
 R. L. Kann, Mechanicsburg, Pa.
 Geo. A. Knopp, Millbrook, N. Y.
 Samuel E. Lloyd, North and Mt. Royal avenues, Baltimore, Md.
 James A. McCloskey, Philadelphia, Pa.
 W. B. Maxson, 153 West 54th street, New York City.
 Edward H. Morris, Derby, Conn.
 Percival K. Nichols, Port Richmond, N. Y.
 F. H. Osgood, Boston, Mass.
 C. B. Palmer, 204 Ferry street, Easton, Pa.
 I. H. Reifsnnyder, Collegeville, Pa.
 H. Reilly, New Haven, Conn.
 J. W. Robinson, Natick, Mass.
 W. H. Robinson, Woodfords, Portland, Me.
 H. W. Read, Freehold, N. J.
 M. J. Reagan, Paterson, N. J.
 Henry S. Weber, 228 Park avenue, Weehawken, N. J.
 S. E. Weber, Lancaster, Pa.
 William T. White, 143 Walnut street, Newtonville, Mass.

VISITORS.

"Masters" Abele, Quincy, Mass.
 Henry Amling, 4228 Park avenue, New York City.
 Charles F. Allen, 105 West 95th street, New York City.
 G. G. Anderson, 417 West 49th street, New York City.
 F. G. Atwood, New Haven, Conn.
 R. A. Balis, Montreal.

A. W. Baker, Brasher Falls, N. Y.
Frank J. Baker, Gouverneur, N. Y.
G. A. Baker, Brasher Falls.
Ernest H. Bancroft, Barre, Vt.
C. S. Barrett, Greenfield, Mass.
S. L. Barrett, Chicago, Ill.
S. D. Beard, Pearl River, N. Y.
S. I. Becton, Rutherford, N. J.
F. H. Bennett, 139 Avenue D, New York City.
R. R. Birch, Ithaca, N. Y.
A. B. Blanchard, 180 Broadway, New York City.
Frederick Boerner, Jr., 5632 Pine street, Philadelphia, Pa.
A. R. G. Bose, 502 Grand street, Troy, N. Y.
H. J. Brotheridge, 3 16th street, Brooklyn, N. Y.
Ernest Buckley, East Orange.
Clarence E. Burchsted, Concord, N. H.
J. P. Bushong, Hattiesburg, Miss.
Wm. F. Braisted, 235 E. 57th street, New York City.
Frank Breed, Pearl River.
Francis and Herbert Brown, Kansas City, Mo.
F. R. Cleveland, Jersey City, N. J.
T. S. Childs, 50 Madison avenue, New York City.
W. F. Christianson, 2842 Shakespeare avenue, Chicago, Ill.
S. H. Chubb, 3492 Bailey avenue, City.
C. C. Cole, Jersey City, N. J.
J. K. Cooke, New York City.
C. I. Corbin, Pawling, N. Y.
S. Corn, Philadelphia, Pa.
A. L. Carrant, 139 Avenue D, New York City.
L. C. Dain, Wellsville, N. Y.
Max Danziger, 119 Clinton avenue, Brooklyn, N. Y.
E. T. Davison, Athenia, N. J.
Jay MacDonald, 153 E. 24th street.
Tom Downing, Washington, Iowa.
C. T. Downs, New Haven, Conn.
Joseph P. Dunn, 1436 Hood, Chicago, Ill.
John G. Eagle, 3924 Morrell avenue, Kansas City, Mo.
A. L. Edwards, Franklin, N. H.
Y. O. Ezman, McKeesport, Pa.
Alex. Eger, 106 East Lake street, Chicago.
J. E. F. Enge, Philadelphia, Pa.
Horace P. Farrington, Brooklyn, N. Y.
Geo. G. Perling, Richmond, Ind.
L. W. Fetzer, U. S. Department of Agriculture.
B. M. Freed, Sharon, Pa.
Geo. L. Frese, Toledo, Ohio.
J. N. Frost, Detroit.
R. W. Gannett, 162 Sterling street, Brooklyn.
W. D. Garber, Harrisonburg, Va.
J. I. Gibson, Des Moines.
Grubel & Co., C. F. Grubel, 69 Beekman street, City.
A. C. Grubel, 69 Beekman street, New York City.
Walter S. Goff, Becton, Dickinson & Co., Rutherford, N. J.
S. A. Goldberg, Richmond Hill, N. Y.
Hon. J. A. Goulden, 180 Broadway, New York City.
Whitfield Gray, Newton, N. J.
H. A. Greer, Danville, Ill.
Wm. H. Gribble, Washington Court House, Ohio.
Arthur L. Grover, New York.

- T. A. G. Hardy, Charleston, S. C.
Jas. B. Hardenburgh, Philadelphia, Pa.
G. F. Harker, Newton, N. J.
Malcolm J. Harkins, Conshohocken, Pa.
Eugene L. Hannon, 186 Bradford street, Pittsfield, Mass.
Frank Hayden, of Becton, Dickinson & Co., Rutherford, N. J.
John J. Hayes, 7 East 42d street, New York City.
D. E. Hichman, West Chester.
Rufus G. Hinton, care of Parke, Davis & Co.
Wm. Hoffman, Kansas City, Kan.
F. D. Holford, D. V. M., Albany, N. Y.
J. H. Holmes, 902 Chapel street, New Haven, Conn.
O. J. G. Hood, 91 Claneanald avenue, Montreal, Quebec.
R. C. Hurlbut, Boonville, Oneida County, N. Y.
J. F. Hutton, East Lansing.
Almond H. Ide, Lowville, N. Y.
Robert Bruce Jenson, Kansas City, Mo.
John J. Kehoe, Philadelphia, Pa.
R. Joly, 662 53d street.
G. S. Jordan, Williamstown, Mass.
M. J. Kellam, Montreal.
Wm. Kelly, Albany, N. Y.
C. P. Kime, Columbia City, Ind.
Capt. Wm. F. Kirchner, New York.
F. F. Koenig, Ithaca, N. Y.
L. D. Kroher, 1306 Hoe avenue, New York.
H. W. Kornobis, 910 Bedford avenue, Brooklyn.
A. P. Lubach, 151 Gordon street.
J. A. Lutz, Philadelphia.
W. H. Lynch, Portland, Me.
J. E. McCarthy, 59 Reade street, New York City.
O. E. McKim, V. S., 522 W. 112th street, New York City.
Archibald McNeil, M. D., White Plains, N. Y.
A. H. McIntosh, 30 Boulevard, Summit, N. J.
H. D. Martin, Buffalo, N. Y.
Geo. H. Mathews, Rutherford, N. J.
W. L. Mebane, St. Albans, Me.
F. D. Meintzer, 716 Knickerbocker avenue, Brooklyn.
H. W. Miller, 190 West Lane avenue, Columbus, Ohio.
John P. Miller, Reading, Pa.
Stuart Miller, 1540 Glenlake avenue, Chicago.
Julius Morh, 103 North Wabash avenue, Chicago, Ill.
H. C. Moore, care of Pitman-Myers Co., Indianapolis.
L. G. Moore, Bonnell, Ontario.
John H. Morse, Sumter, S. C.
A. L. Murch, Bangor, Me.
W. A. Munsell, Green Cove Springs, Fla.
Chas. V. Noback, 1976 Belmont avenue.
Gustave J. Noback, 1976 Belmont avenue.
Alex. T. O'Brien, 1148 St. Johns place, Brooklyn.
H. F. Palmer, Philadelphia, Pa.
E. E. Patterson, Detroit, Mich.
W. H. Phyfe, Middletown, N. Y.
M. Ray Powers, Clemson College, S. C.
W. A. Randall, Rutherford, N. J.
H. P. Rasmussen, Chicago.
N. Rechtenwald, Pittsburgh, Pa.
Andw. R. B. Richmond, Toronto, Can.
Norman H. Ridge, Trivose, Pa.

- Harry B. Risley, 74 Adams street.
Charles F. Roberts, New Haven, Conn.
C. G. Rohrer, New York.
Thos. B. Rogers, Woodbury, N. J.
Frederick P. Ruhl, Milford, Del.
H. B. Scammell, Washington, D. C.
Adam Schaumloeffel, Rutherford, N. J.
Meyer S. Schwartz, Bridgeton, N. J.
E. F. Schofield, Greenwich, Conn.
William Selkin, 1965 Webster avenue.
C. P. Shaughnessy, Chicago, Ill.
B. J. Shanley, Springfield, Chairman, State Board Live Stock Comm.
B. J. Shanley, 629 East Main street, Ottawa, Ill.
William I. Slater, 41 Orange street, Newark, N. J.
Maffitt Smith, 43 West 90th street.
Geo. Stephens, White River Junction, Vt.
H. L. Stevens, Rockland, Me.
B. J. Stockler, 316 Exchange Building.
W. W. Stork, Toronto.
I. A. Stuart, Burlington, N. J.
Evan L. Stubbs, Oxford, Pa.
H. C. Swayzee, Indianapolis, Ind.
W. B. Switzer, Oswego, N. Y.
George F. Sykes, 85 Water street.
Walter F. Sykes & Co., 85 Water street, New York.
J. H. Taylor, Henrietta, N. Y.
J. P. Thieg, Chicago, Ill.
J. M. Teistchler, Cincinnati, Ohio.
E. J. Tucker, Ridgfield Park, N. J.
D. H. Udall, Ithaca, N. Y.
Jesse A. Viles, 58 Coral street, Lowell, Mass.
Fred. F. Walker, Burlington, Mass.
R. E. Waters, 28 Village road, Brooklyn, N. Y.
F. E. Ward, Indianapolis, Ind.
C. R. Webber, 156 Andrews street, Rochester, N. Y.
Ed. L. Wenrick, 11 West 64th street, New York City.
M. P. Whitten, 103 North Wabash avenue, Chicago, Ill.
A. E. Wight, Little Rock, Ark.
L. A. Willson, 45 Riverdale avenue, Toronto, Ont.
L. B. Wolcott, Glenolden, Pa.
F. E. York, Eagleville, N. Y.
John J. Young, 149 Bedford avenue, Brooklyn.
F. A. Zucker, 329 Union avenue, Elizabeth, N. J.
F. H. Zucker, 329 Union avenue, Elizabeth, N. J.
Chester Zucker, 329 Union avenue, Elizabeth, N. J.
William Allen, New Orleans, La., New Orleans Association of Commerce.
P. J. Axtell, Binghamton, N. Y.
A. W. Baker, 23 Ferry street, Binghamton, N. Y.
A. J. Battin, Elmira, N. Y.
Hon. Martin Behrman, New Orleans, La.
Tom W. Bennett, 23 5th avenue, New York City.
Bruce Blair, Jersey City.
E. G. Britton, Butler.
John W. Buckley, 600 Carlton avenue.
F. H. Buet, Chena, Ill.
H. G. Carpenter, Ithaca, N. Y.
W. S. Corbis, 34 South 6th avenue, Mount Vernon.
D. J. Cronin, Chelsea, Mass.

- D. B. Doughty, Woodbury, Long Island.
J. D. Dunkel, 104 W. 42d street, City.
Gerald J. Etienne, 67a Drummond street, Montreal, Que.
J. B. Fallon, Beloit, Wis.
Francis Falls, Phoenixville, Pa.
J. H. Ferster, 351 West 11th street, New York City.
Saml. S. Field, 2 North Columbia street, Hempstead, N. Y.
F. D. Fordham, Waltham, N. Y.
J. E. Foster, Coshocton, Ohio.
Hugh Gaw, North Attleboro, Mass.
W. L. Gilbert, D. V. M., Middleburgh, N. Y.
Henry A. Gilman, 156 Jerome street, Brooklyn, N. Y.
Herbert L. Gilman, 156 Jerome street, Brooklyn, N. Y.
Louis Griessman, 1049 Lexington avenue, New York City.
Grubel & Co., New York.
Theo. Greenewald, New Orleans.
O. Habelshofer, New York City.
G. S. Hopkins, Ithaca, N. Y.
L. D. Horner, Woodstown, N. J.
E. A. Hubbard, New York City.
L. P. Hurley, Hopewell, N. J.
E. B. Ingalls, Mohawk, N. Y.
F. A. Ingram, Hartford, Conn.
Chas. Jamieson, 120 Williams avenue, Brooklyn.
A. F. Johnson, 171 3d avenue, New York City.
W. J. Johnston, Geneva, N. Y.
C. I. Jones, Oxford, Chenango County, N. Y.
T. J. Keane, Philadelphia, Pa.
H. Koch, 957 Bushwick avenue, Brooklyn, N. Y.
G. H. Krall, New York City.
Morton Loun, Kingston.
David McAuslin, 265 Flatbush avenue, Brooklyn, N. Y.
Edward McCall, New York City.
F. E. McClelland, 455 Ellicott street, Buffalo, N. Y.
A. A. McDowell, North Adams, Mass.
E. P. McKeeffe, 50 East 41st street.
G. Fleming McInnes, M. D., Charleston, S. C.
Paul J. Moore, Newark, N. J.
Oscar Nelson, Woodcliff Lake, N. J.
O. M. Norton, Greenville, Miss.
Timothy O'Dea, Union Hill, N. J.
J. F. Olweiler, Elizabethtown, Pa.
Leon L. Parker, Catskill.
R. N. Rivers, Lansdale, Pa.
E. E. Russell, Farmington, Me.
Ernest Schuthess, South Orange, N. J.
W. L. Scofield, 351 West 11th street.
I. L. Selley, Shawhegan, Me.
John Sheridan, Dover, N. J.
Maffett Smith, 43 W. 90th street.
Wright J. Smith, Kingston.
F. W. Specht, 28 W. 97th street, New York.
G. H. St. John, Utica, N. Y.
S. Stock, New York City.
A. Robert Tafe, M. D., Charleston, S. C.
C. S. Tamlin, London, Ont.
N. S. Townsend, 104 West 42d street, New York.
Peter F. Trainor, 266 Barrow street, Jersey City.
H. C. Wallace, Hoboken, N. J.

- H. S. Wende, Tonawanda.
G. J. White, Chicago.
C. A. Williams, 156 West 105th street, New York City.
J. B. Williams, Rockford, Ill.
M. H. Williams, Sunderland, Mass.
R. E. Willis, Woodbridge, Ont.
Edw. S. Wilson, 335 W. 45th street, City.
Jno. H. Wilson, London, Canada.
Edwin J. Banzhaf, New York City.
Walter L. Bell, Brooklyn, N. Y.
H. H. Butler, Westfield, N. J.
G. E. Chesley, Rochester, N. H.
J. F. Creedon, 351 West 11th street, New York City.
Wm. H. Daly, 867 Putnam avenue, Brooklyn.
S. Damon, 115 East 89th street, New York.
J. D. De Ronde, 72 East 82d street, New York City.
C. E. Doll, Huntington, Long Island, N. Y.
J. J. Ferguson, Secretary, U. S. Livestock Sanitary Association,
Chicago, Ill.
George Hansen, Glenolden, Pa.
A. G. Hall, Earlville.
M. F. Henry, 317 West 93d street, New York, N. Y.
George A. Hazel, 113 East 83d street, New York City.
Charles A. Kehr, Hopewell Junction, Dutchess County, N. Y.
W. B. Kelly, Rockville Centre, Long Island.
Philip Loeb, New York.
R. A. McAuslin, 397 Carlton avenue, Brooklyn, N. Y.
Anthony McCloskey, 400 Evergreen avenue, Chestnut Hill, Pa.
L. McLean, Brooklyn, N. Y.
E. F. Maguire, Cedarhurst, Long Island.
James R. Mahoffy, Wilmington, Del.
Louis Mansback, Philadelphia.
James Mosedale, Morristown, N. J.
R. E. Mosedale, Bernardsville, N. J.
J. H. Muller, Jersey City, N. J.
C. H. Peabody, Hartford, Conn.
Walter F. Phelan, 279 Nepperhan avenue, Yonkers, N. Y.
R. R. Ramsey, 316 Newark avenue.
Peter Runyon, Freehold, N. J.
J. S. Schofield, Greenwich, Conn.
Stephen A. Selby, 429 West 43d street.
G. K. Swank, Mauch Chunk, Pa.
J. E. Underhill, New London, Conn.
P. V. Weaver, Glen Cove, N. Y.
F. O. Wright, White Plains.
F. A. Zucker, Elizabeth, N. J.
E. B. Barnes, 851 6th avenue, New York City.
L. J. Beason, Pawling, N. Y.
W. E. Beully, New York.
John Britton, Concord, N. H.
Master Caswell, 550 W. 186th street, New York.
L. W. Cogswell, New Haven, Conn.
Joseph E. Conlin, 55 Clark street, Hartford, Conn.
Lawrence T. Dunn, Providence, R. I.
Bart English, 2d U. S. Cavalry, Fort Bliss, Texas.
J. C. Flynn, 3028 Main street, Kansas City, Mo.
P. F. Finnigan, Hartford, Conn.
D. R. Geary, Leominster, Mass.
Auguste Gerald, Brooklyn, N. Y.

D. C. Gilles, Washington, D. C.
Frank J. Glynn, 23 6th street, Weehawken, N. J.
Leland D. Ives, 197 Greene avenue, Brooklyn, N. Y.
W. G. Kingsley, Kingston, N. Y.
Master Harold MacKellar, 287 West 4th street, New York City.
Master Robert S. MacKellar, 287 West 4th street, New York City.
H. A. Pegan, Cochran, Pa.
J. Dwight Pierce Springfield, Mass.
L. E. Rodecla.
Z. L. Rogers, East Palestine, Ohio.
George H. Shaw, 1235 East 19th street, Brooklyn, N. Y.
C. H. Swanger, New York.
Thomas E. Tiquin, Sherburne, N. Y.
H. L. Tower, New Haven, Conn.
I. R. Vail, 20 George street, New Haven, Conn.
A. B. Sticker, 103 Whitestone avenue, Flushing, L. I.

LADIES.

Mrs. S. H. Chubb, New York.
Mrs. D. H. Udall, Ithaca, N. Y.
Mrs. Geo. B. Vliet, Hackettstown, N. J.
Mrs. J. T. Nattress, Delavan, Ill.
Mrs. W. B. Warleson, Tiffin, O.
Mrs. L. R. Webber, Rochester, N. Y.
Mrs. C. R. Webber, 57 Hortense street, Rochester, N. Y.
Mrs. W. E. Wight, 237 McKee place, Pittsburgh, Pa.
Miss Gertrude Nattress, Delavan, Ill.
Mrs. F. W. Andrews, Mt. Kisco, N. Y.
Mrs. W. L. Williams, Ithaca, N. Y.
Mrs. R. E. Waters, 28 Village road, Gravesend
Mrs. D. S. White, Columbus, O.
Miss H. G. Young, Brooklyn, N. Y.
Marie A. Young, Brooklyn, N. Y.
Mrs. F. E. York, Earlville, N. Y.
Mrs. J. Traum and boy, Washington, D. C.
Mrs. C. H. Taylor, De Kalb, Ill.
Mrs. J. P. Turner, Washington, D. C.
Mrs. Thacker, Ruefren, Vt.
Mrs. F. H. Schneider, Philadelphia.
Miss Frances Schneider, Philadelphia.
M. S. Schwartz, Philadelphia, Pa.
Mrs. D. Schreck, New Haven, Conn.
Mrs. Edgar H. Shepard, 2027 East 105th street, Cleveland, O.
Mrs. Jas. Smellie, Eureka, Ill.
Mrs. H. C. Swayzee, Indianapolis, Ind.
Mrs. J. Scheibler, Memphis, Tenn.
Mrs. SESCO Stewart, Kansas City.
Mrs. W. M. Sunprew, Muldoon, Mass.
E. W. Stambaugh, Sharon, Pa.
Mrs. H. E. State, Detroit, Mich.
Mrs. H. L. Stevens, Rockland, Me.
Mrs. W. H. Ridge, Trevore, Pa.
Mrs. H. B. Rapp, Ashland, O.
Mrs. E. M. Ranck, Mississippi.
H. B. Risley, Brooklyn, N. Y.
Mrs. John F. Ryan, 2525 Indiana avenue, Chicago, Ill.

- Miss Ryder, New York.
Mrs. J. E. Ryder, New York.
Mrs. T. E. Robinson, Westerly, R. I.
Miss Antoinette Peters, Springfield, Ill.
Miss Florence Peters, Springfield, Ill.
Miss La Verne Patterson, 650 Grand River avenue, Detroit, Mich.
Mrs. W. H. Phyfe, Middletown, N. Y.
Mrs. H. F. Palmer, Philadelphia, Pa.
Mrs. J. G. Pfersick, Greenfield, Mass.
Mrs. B. D. Peirce, Springfield, Mass.
Mrs. E. E. Patterson, Detroit, Mich.
Mrs. A. T. Peters, 1360 Holmes avenue, Springfield, Ill.
Mrs. Byron S. Price, 65 Central Park West, New York.
Miss Marie Rectenwald, 11 Arlington avenue, Pittsburgh, Pa.
Miss Lulu Nattress, Delavan, Ill.
Mrs. H. E. Nunn, East Orange, N. J.
Mrs. J. V. Newton, Toledo.
Mrs. L. G. Moore, Barnweld, N. Y.
Mrs. B. J. Shanley, Springfield, Ill.
Mrs. A. L. Murch, Bangor, Me.
Mrs. Wm. Herbert Lowe, Paterson, N. J.
Mrs. D. M. Craig, McAdams Junction, N. B.
Mrs. Geo. McKillip, Chicago, Ill.
Mrs. G. W. Meyer, 2991 Marion avenue, Bronx.
Mrs. C. J. Marshall, Philadelphia.
Mrs. Jno. P. Miller, Reading, Pa.
Mrs. A. E. Moore, Ottawa, Ont.
Miss Mary E. Moore, Ithaca, N. Y.
Mrs. Paul Mortimor, Brooklyn, Pa.
Miss Florence Mortimore, Brooklyn.
Mrs. W. H. Lytle, Salem, Ore.
Mrs. G. Ed Leech, Winona, Minn.
Miss May I. McKinley, Brooklyn, N. Y.
Miss Maud I. McKinney, 124 Lee avenue, Brooklyn, N. Y.
Mrs. W. J. McKinney, 124 Lee avenue, Brooklyn, N. Y.
Miss Mildred Kime, Columbia City, Ind.
Mrs. C. P. Kime, Columbia City, Ind.
Mrs. A. T. Kinsley, Kansas City.
Mrs. T. F. Krey, Detroit, Mich.
Mrs. B. Y. Kron, 1386 Golden Gate avenue, San Francisco, Cal.
Mrs. D. T. Keely and daughter, Waterbury.
Mrs. A. C. Knapp, Bridgeport, Conn.
Mrs. W. H. Kelly, Albany, N. Y.
Mrs. W. D. Yarbes, Harrisonburg, Va.
Miss Ruth Kelly, Albany, N. Y.
Mrs. M. Jacob, Knoxville, Tenn.
Mrs. G. S. Jordan, Williamstown, Mass.
Mrs. R. Joly, New York.
Mrs. T. E. Jago, Athens, Ga.
Mrs. A. Joly, Waterville, Me.
Mrs. A. H. Ide, Laureville, N. Y.
Mrs. Frank Hunt, 409 Cherry, Jamestown, N. Y.
Mrs. A. S. Houchin, Newark, Del.
Mrs. Charles H. Higgins, 196 Cartier street, Ottawa, Canada.
Mrs. W. H. Hoskins, Philadelphia.
Mrs. J. B. Hollingsworth, 105 Cambridge street, Ottawa, Ont.
Mrs. Rubin Hilty, Toledo, O.
Mrs. M. Hazleton, Queens, L. I.

- Mrs. F. D. Holford, Albany, N. Y.
Mrs. C. Hennigs, New York.
Miss J. H. Hood, Montreal, Canada.
Mrs. J. H. Henderson, Montreal.
Mrs. I. C. Hurlburt, Booneville, N. Y.
Mrs. Chas. E. Hill, Philadelphia.
Mrs. Jacob Helmer, Scranton, Pa.
Mrs. D. E. Hickman, Westchester, Pa.
Mrs. G. F. Harker, Trenton, N. J.
Miss Grace Huff, Rome, N. Y.
Mrs. J. T. Glennon, 27 Clay street, Newark, N. J.
Mrs. Ellen Glennon, 148 Second street, Newark, N. J.
Miss R. E. Greer, 5513 Drexel avenue, Chicago, Ill.
Mrs. D. W. Groves, Hamilton, Ont.
Mrs. H. A. Greer, 407 Robinson street, Danville, Ill.
Mrs. G. E. Green, Scarsdale, N. Y.
Mrs. J. H. Griffiths, 74 Second place, Brooklyn, N. Y.
Mrs. P. A. Fish, Ithaca, N. Y.
Mrs. Geo. Furling, Richmond, Ind.
Mrs. B. M. Freed, Sharon, Pa.
Mrs. J. D. Fair, Millersburg, O.
Mrs. Alexander Eger, Chicago, Ill.
Mrs. J. O. Eyman, McKeesport, Pa.
Mrs. Adolf Eichhorn, Washington, D. C.
Mrs. R. W. Ellis, New York.
Mrs. L. E. Day, Chicago.
Mrs. E. C. Quigley, Philadelphia, Pa.
Miss Audrey Dunphy, Quincy, Mich.
Mrs. G. W. Dunphy, Quincy, Mich.
Mrs. Robert Dickson, Fairhaven, N. J.
Miss Aimee Stone, Philadelphia, Pa.
Mrs. C. B. Coburn, Philadelphia, Pa.
Miss Ruth De Yringe, 219 West 145th street, New York.
Mrs. C. T. Downs, New Haven, Conn.
Mrs. J. S. Donald, Bay City, Mich.
Mrs. H. B. Cox, Philadelphia.
Mrs. David W. Cochran, 120 West 12th street, New York.
Mrs. A. S. Cooley, Cleveland, O.
Miss Harriet Coombs, Paterson, N. J.
Mrs. T. S. Childs, New York.
Miss Margaret Cotton, 3145 Portland avenue, Minneapolis, Minn.
Miss Jessie I. Cochran, 120 West 12th street, New York City.
Miss Edith C. Cochran, 120 West 12th street, New York.
Mrs. F. F. Brown, Kansas City, Mo.
Mrs. C. S. Barrett, Greenfield, Mass.
Mrs. H. E. Bemis, Ames, Ia.
Mrs. F. F. Brown, Kansas City, Mo.
Mrs. H. J. Brotheridge, Brooklyn, N. Y.
Mrs. W. R. Blair, New York.
Mrs. R. R. Bell, Brooklyn, N. Y.
Mrs. F. A. Bolser, New Castle, Ind.
Mrs. O. L. Boor, Muncie, Ind.
Mrs. J. F. Barnes, Toledo, O.
Mrs. R. A. Bailie, Montreal.
Miss N. C. Berns, Brooklyn, N. Y.
Mrs. D. E. Buckingham, Washington, D. C.
Mrs. G. M. Breen, New York.
Miss Nettie L. Breen, New York.

- Mrs. R. R. Birch, Ithaca, N. Y.
Mrs. Chas. J. Becker, Stevenson, Ala.
Miss K. C. Baker, 194 Wilton street, Montreal, Canada.
Mrs. A. H. Baker, 5651 Peoria street, Chicago.
Mrs. S. S. Baker, Chicago.
Mrs. Geo. F. Babb, Topeka, Kas.
Mrs. E. B. Ackerman, 185 Gates avenue, Brooklyn, N. Y.
Mrs. R. A. Archibald, Oakland, Cal.
Mrs. J. P. Aikenhead, Easton, Md.
Mrs. F. G. Atwood, 158 Whalley avenue, New Haven, Conn.
Mrs. Geo. Stephens, White River, Vt.
Miss Bertha van H. Anthony, Research Lab., New York Health Dept.
Mrs. Frances Abele, Quincy, Mass.
Mrs. J. P. Axtell, Binghamton, N. Y.
Mrs. U. S. G. Bieber, Kutztown, Pa.
Mrs. F. H. Burt, Chena, Ill.
Mrs. J. P. Bushong, Cattiesburg, Miss.
Mrs. Thos. Castor, Philadelphia.
Mrs. Chas. S. Chase, Bay Shore, N. Y.
Mrs. I. Clark, New York.
Mrs. C. C. Dauber, Sturgis, Mich.
Miss H. M. Deane, North Raynham, Mass.
Mrs. H. F. Eckert, Markesan, Wis.
Mrs. H. P. Eves, Wilmington, Del.
Mrs. W. L. Gilbert, Middleburg, N. Y.
Mrs. H. D. Gill, New York.
Mrs. W. Giltner, Lansing, Mich.
Mrs. R. C. Gross, Elizabethtown, Pa.
Mrs. W. A. Haines, Bristol.
Mrs. Herbert F. Harms, Pearl River, N. Y.
Mrs. R. W. Hickman, Washington, D. C.
Mrs. L. D. Horner, Woodstown, N. J.
Mrs. E. A. Hubbard, New York City.
Mrs. G. A. Johnson, Sioux City, Iowa.
Mrs. T. J. Kean, Philadelphia, Pa.
Mrs. Thos. Kelly, Philadelphia.
Mrs. G. W. Loveland, Torrington, Conn.
Miss May Loveland, Torrington, Conn.
Mrs. G. W. Lovell, Torrington, Conn.
Miss Malbelle Lovell, Torrington, Conn.
Mrs. J. A. Lutz, Saunders, Conn.
Mrs. R. P. Lyman, East Lansing, Mich.
Mrs. F. H. McCarthy, Pottsville, Pa.
Miss J. McDonough, Montclair, N. J.
Mrs. F. H. Mackie, Baltimore, Md.
Mrs. R. P. Moody, Maysville, Ky.
Miss Frances Moore, Barneveld, N. Y.
Mrs. John H. Moore, Sumter, S. C.
Mrs. T. E. Munce, Harrisburg.
Mrs. O. G. Noack, Reading, Pa.
Mrs. L. A. Paquin, Webster, Mass.
Mrs. C. D. Pearce, Binghamton, N. Y.
Mrs. C. H. Perry, Worcester, Mass.
Mrs. Edgar W. Powell, Bryn Mawr, Pa.
Mrs. J. H. Roberts, 64 King street, Northampton, Mass.
Mrs. W. Runge, Newark, N. J.
Mrs. J. W. Sallade, Auburn, Pa.
Miss Kathryn Sallade, Auburn, Pa.

- Mrs. L. A. Severcool, Elyria, Ohio.
Mrs. Thos. Sheldon, Rhinebeck, N. Y.
Mrs. Jno. Sheridan, Dover, N. J.
Mrs. W. J. Smith, Kingston, N. Y.
Mrs. A. C. Specht, New York City.
Mrs. G. F. Stone, Norwich, N. Y.
Mrs. M. H. Williams, Sunderland, Mass.
Mrs. A. N. Baker, Binghamton, N. Y.
Mrs. H. E. Bates, South Norwalk, Conn.
Mrs. J. H. Carter, Mt. Holly, Pa.
Mrs. R. W. Carter, Jobstown, N. J.
Mrs. G. E. Chesley, Rochester, N. H.
Mrs. E. L. Cornman, Philadelphia, Pa.
Mrs. Thos. Fraser, Richmond, Va.
Mrs. R. W. Gannett, Brooklyn.
Mrs. A. G. Hall, Earlville, N. Y.
Mrs. John B. Hopper, Ridgewood, N. J.
Miss Grace Houchin, New York City.
Mrs. Howard, Kansas City, Mo.
Mrs. Lester H. Howard, 187 Huntington avenue, Boston, Mass.
Mrs. W. Kelly, Philadelphia, Pa.
Mrs. W. Kelly, Jr., Philadelphia, Pa.
Mrs. R. H. Kingston, New York City.
Mrs. C. J. Marshall, Philadelphia.
Mrs. H. W. Miller and son, Columbus, Ohio.
Miss Marie Nobach, New York.
Mrs. F. E. Palmer, Owatonna, Minn.
Miss Florence Powers, Kansas City, Mo.
Mrs. Rausgate, New York City.
Mrs. Chas. Rausgate, New York City.
Mrs. C. J. Rohrer, New York City.
Mrs. H. R. Schwarze, Springfield, Ill.
Mrs. C. A. Schaffer, Philadelphia, Pa.
Mrs. A. B. Sexmith, Charlotte, Mich.
Mrs. N. J. Spain, Chicago, Ill.
Miss Elizabeth Stevens, Brooklyn.
Miss Julia Stevens, Brooklyn.
Mrs. B. J. Stockley, Chicago, Ill.
Miss Amelia Syren, Philadelphia, Pa.
Mrs. Mulford C. Thompson, Sharon, Conn.
Mrs. N. L. Townsend, Ridgewood, N. J.
Mrs. R. E. Willis, Ontario, Canada.
Mrs. David B. Comstock, Albany, N. Y.
Christina H. Faust, 211 Union street, Poughkeepsie, N. Y.
Mrs. J. C. Flynn, Kansas City, Mo.
Dorothea Gifford, New York City.
Mrs. C. E. Hershey, Tiffin, Ohio.
Mrs. Maria F. Hickok, 211 Union street, Poughkeepsie, N. Y.
Mrs. Geo. A. Knapp, Millbrook, New York.
Dorothy A. Lowe, 171 Jefferson street, Passaic, N. J.
Miss Mabel M. Lowe, Passaic, N. J.
Mrs. R. S. MacKellar, 287 West 4th street, New York City.
Mrs. L. E. Rodeck, New York.
Mrs. Z. L. Rogers, East Palestine, Ohio.
Mrs. Thomas E. Tequin, Sherburne, N. Y.
Mrs. E. J. Tucker, Ridgefield Park, N. J.
Mrs. W. B. Kelley, Rockville Center, N. Y.
Miss Anita Fitzpatrick, Philadelphia, Pa.
Mrs. H. R. Schwarze, Springfield, Ill.

NEW MEMBERS.

Two hundred and thirty-two (232) new members were received into the association from the following forty-nine states, territories and Canadian provinces: Alabama, 4; Arizona, 1; California, 10; Colorado, 3; Connecticut, 5; District of Columbia, 3; Georgia, 2; Hawaii, 4; Illinois, 4; Indiana, 8; Iowa, 7; Kentucky, 1; Louisiana, 1; Maine, 3; Maryland, 2; Massachusetts, 1; Michigan, 8; Minnesota, 4; Mississippi, 3; Missouri, 5; Montana, 3; Nebraska, 1; New Hampshire, 1; Nevada, 1; New Jersey, 8; New York, 37; North Dakota, 11; Ohio, 9; Oregon, 2; Pennsylvania, 38; Philippine Islands, 6; South Carolina, 3; South Dakota, 1; Texas, 4; Vermont, 9; Virginia, 1; Washington, 6; West Virginia, 2; Wisconsin, 2; Wyoming, 1; Alberta, Can., 1; British Columbia, 2; Manitoba, 5; Nova Scotia, 2; Ontario, 3; Quebec, 3; Saskatchewan, 7; Tennessee, 8.

OFFICERS FOR 1913-1914.

President, C. J. Marshall, Pennsylvania; First Vice-President, Fred Torrance, Dominion of Canada; Second Vice-President, Adolph Eichhorn, District of Columbia; Third Vice-President, W. Reid Blair, New York; Fourth Vice-President, R. A. Archibald, California; Fifth Vice-President, M. Jacob, Tennessee; Secretary, N. S. Mayo, Virginia; Treasurer, Geo. R. White, Tennessee; Librarian, D. H. Udall, New York.

THE PAPERS AND DISCUSSIONS.

There was probably never such a lot of splendid papers, covering every phase of veterinary science, presented at any previous meeting, as were presented to the New York meeting; and the discussions were of just such a high quality. So that an immense wealth of material has been gathered at the several sections, for publication in the proceedings. So much, in fact, that it would almost seem to us that two volumes would have to replace the customary one volume of previous years. That is only an impression, however, and we have no data to verify it.

SECRETARY'S AND TREASURER'S REPORT.

Secretary Marshall's report was along the same lines as advocated by him last year. He also referred to the advisability of a permanent secretary with sufficient salary to make it possible

for him to give his entire time to it. The full report will be published in the proceedings.

TREASURER WHITE'S REPORT, as stated in the September issue of the REVIEW, on page 668, shows a balance in treasury to the credit of the AMERICAN VETERINARY MEDICAL ASSOCIATION, of \$3,162.23.

THE PATHOLOGICAL EXHIBIT.

One of the most instructive as well as interesting features of the meeting was the pathological exhibit in College Hall. This collection of pathological specimens, embracing nearly all the diseases of cattle, sheep and swine, were the most beautifully prepared and mounted specimens that it has been our pleasure and privilege to examine, and we believe that was the general impression on those present. The members and visitors at the A. V. M. A. meeting had the privilege of examining this rare collection, the property of the United States Bureau of Animal Industry, through the courtesy of President John R. Mohler, of the A. V. M. A., Chief of the Pathological Division of the B. A. I.

The exquisite work in the preparation of this collection of watch-glass specimens, we understand, was executed by one of our A. V. M. A. members who was present at the meeting, but whose modesty restrained him from mentioning the fact, even when present at the exhibit, as he occasionally was, and would quietly explain some particular specimen to an inquiring visitor. We refer to D. L. Enos Day, Veterinary Inspector, in charge of the Branch Pathological Laboratory of the Bureau of Animal Industry at Chicago. Dr. Day certainly is to be complimented on his exquisite work, and deserves a vote of thanks from the entire veterinary profession of America, which we now extend to him through the AMERICAN VETERINARY REVIEW.

EXHIBIT OF HORSES' SHOES AND PATHOLOGICAL CONDITIONS OF HORSES' HOOFS.—Also in College Hall, just opposite the pathological exhibit of the U. S. Bureau of Animal Industry, there was a most interesting collection of horse shoes of various designs to overcome certain diseased conditions and incorrect forms of hoofs; also quite a number of dry specimens of diseased and deformed hoofs. This interesting exhibit was kindly loaned by the Veterinary School of the University of Pennsylvania.

THE BANQUET.

About three hundred persons assembled in the beautiful north ballroom of the Hotel Astor at the banquet on the evening of September 4. The dinner was conceded to be an excellent one, and the speaking that followed unusually interesting. This function of the meeting was voted a success by those who attended it.

VETERINARY MEDICAL ASSOCIATION OF NEW
YORK CITY.

(JUNE MEETING).

The regular monthly meeting of this association was called to order by President McKinney at 8.45 p. m., June 4, 1913.

The minutes of the May meeting were read and approved.

The prosecuting committee reported progress.

Dr. K. F. Meyer, Director of the Pennsylvania State Live Stock Sanitary Board was then introduced and gave an instructive address entitled, "The Discussion of Several Interesting Diseases."

Dr. Meyer stated that some more accurate test is needed for glanders, as even mallein has proven to be about 25 per cent. inaccurate. He also said that in 2,000 head tested with the dry mallein, the results were gratifying, as this method proved to be 98 per cent. accurate. In the eye test the small amount of mallein used and absorbed from the conjunctiva will cause a rise in temperature, and a typical reaction should show pus and tears discharging from the eye, visible at a distance of ten or fifteen feet, eyelids swelled, photophobia, marked lachrymation and sensitiveness to touch. The reaction is most pronounced from about the 12th to the 15th hour, but should subside in 24 hours. Can retest 24 hours later with same amount, and in a glandered animal the reaction is very pronounced, the eyelids being glued together, whereas in a doubtful case the eye will clear up. The advantage of this method is that it has no effect on the results of the sera tests. Blood tests after the use of mallein will show positive glanders in from six to ninety days.

Dr. Meyer also mentioned the disease known as epizootic lymphangitis or, as he says it should be called, sporotichosis.

The yeast of this disease cannot be cultivated. The clinical picture presented by a case of this kind is almost identical to

farcy. At the beginning it always starts with a nodule and forms a funnel-shaped ulcer. The pus is more green, sticky and clumpy. Majority of cases occur in right hind limb, and the infection generally enters from a wound and may spread over the entire body, but does not affect the internal organs.

It is not contagious or epizootic. It is contracted on the watersheds of the Alleghany and Ohio sections from a fungus growth on the bark of logs.

The curative agent used is the iodide of potash.

Also mentioned abortion in mares which has not been so fully studied as abortion in cattle. This condition is due to a bacillus related to the typhoid group.

In answer to the question by Dr. Chase as to what progress had been made in the treatment of abortion by the use of a vaccine, Dr. Meyer stated that a revolution had taken place regarding immunization with vaccines, as the living cultures cannot be used in pregnant animals. The commercial vaccines cause sterility.

Dr. Berns stated that he had been experimenting with the ophthalmic test for the past two weeks and asks what causes the local reaction, and local reaction only, in glandered horse, and glandered horse only.

Dr. Meyer said that immune bodies and specific antigen come together in the conjunctiva as well as the rest of the system. We get the same local reaction in a subcutaneous injection. The complement cannot act on antigen in a healthy horse because there are no immune bodies.

Dr. Clayton asked how long will living bacilli remain in the system.

Dr. Meyer answered, about one year, and also stated that the abortion test is about 87 per cent. correct.

The best treatment is isolation, flushing out, and mechanical cleansing.

Dr. J. A. McLaughlin, of New York City, then read an interesting paper entitled, "Dystokia in the Bitch. Some Observations Made While Performing the Caesarian Operation." The doctor gave a detailed account of his experience with this condition, citing several cases, and recommends that the Caesarian operation be performed before too much time has elapsed, and other useless measures been employed.

This interesting subject was discussed by several of the members present. Dr. Gill moved that a vote of thanks be extended the essayists of the evening. Seconded and unanimously carried.

Dr. W. L. Johnson, whose application had been favorably reported on by the Board of Censors, was unanimously elected a member of the association.

Dr. Berns expressed his thanks for the expression of sympathy tendered him by the association in his recent bereavement.

Dr. Ackerman also thanked the association likewise.

Dr. Berns also reminded the members that the great A. V. M. A. meeting was not far off, and a large fund would be necessary to entertain the members and guests, and urged that liberal contributions be sent to Dr. Cochran at once.

Dr. Ellis stated that he took great pleasure in announcing that the Governor had signed the College Bill on May 24, 1913, thus perpetuating the old school as a State college.

Dr. W. Horace Hoskins, of Philadelphia, spoke of the alumni being gratified by the signing of this bill, and also spoke of the Army Bill, known as House Bill No. 4541, urging every veterinarian to give it his support.

After a discussion of various subjects the meeting adjourned.

The president appointed Drs. Berns, Ellis and Blair as delegates to the A. V. M. A. and the New York State Veterinary Medical Society meeting.

ROBT. S. MACKELLAR, Secy.

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION.

The seventh annual meeting of this association was held on August 29, 1913, at the Agricultural College, at Starksville, Miss.

The president of the association being absent, the organization was called to order by the Vice-President, Dr. B. M. Leigh, of Meridian, Miss.

The meeting was one of peculiar interest to the live stock industry of Mississippi. Many important matters of special interest to the profession were considered by the association; one of which was an act to be strongly presented to the Legislature in January, regulating the practice of Veterinary Surgery, Medicine and Dentistry in Mississippi, which is sure to come in time.

Three were admitted to membership. Several interesting papers were presented.

This association has a membership consisting of practically

every graduate veterinarian in the State, and its perfect harmony is the most pleasing feature of the organization.

Committee appointed on Legislation, Drs. Wm. P. Ferguson, Grenada, Miss.; John Oliver, Columbus, Miss.; E. M. Ranck, State Veterinarian, Agricultural College, Miss.

The next meeting of the association will be held at the A. and M. College, Starksville, Miss., December 29, 1913.

Officers elected: Drs. B. M. Leigh, President, Meridian, Miss.; D. M. Davenport, Vice-President, Hattisburg, Miss.; Wm. P. Ferguson, Secretary and Treasurer, Grenada, Miss.

WM. P. FERGUSON, Secretary.

YORK COUNTY VETERINARY MEDICAL SOCIETY.

This organization held its quarterly meeting the first week in September at the National Hotel, York, and had a large attendance of veterinarians present from the city and county.

Interesting discussions occurred on the subjects of glanders, tetanus, impaction of the bowels, intestinal catarrh, bloating in cattle, chronic indigestion, parturient paresis, red milk, mamitis, etc.

The operation for roaring in horses was also thoroughly discussed; in fact, all subjects of especial interest to practitioners; and each veterinarian present departed for home feeling well repaid for the time spent in attendance at the meeting. Dr. O. C. Newhaus was elected to membership in the association.

The meeting adjourned to meet in York in December.

E. S. BANSTICKER, Secretary.

NEW YORK STATE COLLEGE AT NEW YORK UNIVERSITY OPENED.—Just as we were closing our forms we received the announcement from New York University of the opening of the veterinary school as a state institution, which was to take place at the University buildings, Washington Square East, on September 24th. The opening address to be made by the Chancellor, Dr. Elmer Ellsworth Brown. Other speakers, Dr. Egbert Le Fevre, Dean of the Medical School; Dr. W. H. Park, also of the Medical Department; Dr. W. Horace Hoskins, of Philadelphia, an alumnus of the Veterinary School, and others. An account of it will be given in our next number.

NEWS AND ITEMS.

A. V. M. A. NOTES.

The registration was 947 at our last count.

The association increased its membership 232 members during the New York meeting.

Prof. Franz Hutyra, Dean of the Royal Veterinary High School, Budapest, Hungary, Prof. Robert V. Ostertag and Sir Stewart Stockman were elected honorary members at the recent meeting.

The cruise in the waters of the Hudson and New York Bay on the Steamer Rosedale on the afternoon of September 4th seemed to be a welcome relaxation from the close application at the sessions, and was much enjoyed.

Two invitations were extended to the association for the 1914 meeting, one from New Orleans, the invitation being extended by Mayor Behrman of that city, enthusiastically backed by Dr. Dalrymple, and another from the Missouri Valley veterinarians to come to Kansas City, the invitation being cordially extended by Dr. S. Stewart. No decision had been reached at the time of this writing, but there seemed to be considerable sentiment during the convention for the "Land of Romance," and we are inclined to believe that New Orleans will be chosen.

A very interesting and instructive feature of the meeting was the splendid exhibition of instruments, veterinary books, drug preparations, vaccines, etc. This is not a new feature, but the excellent arrangement connecting the exhibition hall direct with

the meeting halls added much to the attractiveness of the exhibits, which in consequence were much more satisfactory to the exhibitors, and were a source of education to the veterinarians who passed through the exhibition hall; (which, bright and prettily decorated, simulated a fancy bazaar), to and from the meetings. They seemed to find it difficult to keep out, and the exhibitors were kept busy taking orders.

The report of Chairman Hoskins of the Committee on Legislation shows that in addition to the splendid service rendered the association and the profession of the United States in the cause of the Army Veterinary Service, so well known to everyone, he was also alert to another great question of vital importance to the profession; the bill to modify and control the sale of habit-forming drugs. Dr. Hoskins learned that the bill, as it was drawn, to apply alike to veterinarians and physicians, if passed, would work a great hardship on the veterinarians. He explained this point to those introducing the bill, pointing out the fact that as applied to veterinarians nothing was to be gained by the passage of the bill in that form, but a great hardship worked upon them, and was able to have the bill so modified as to remove the objection, for which the veterinarians of the country owe him a debt of gratitude.

MAYOR GAYNOR'S SUDDEN DEATH.—It is with much regret that we record the sudden taking away of the Hon. William J. Gaynor who, as Chief Magistrate of the host city of the A. V. M. A., was to have welcomed its members to the city of New York on September 1, but for an illness that overtook him about that time, and from which he died at sea a little more than a week later. There existed a bond of sympathy between the late Mayor of New York and the veterinary profession, as he was a lover of horses. In fact, he was fond of all animals, and had many animal pets at his home at St. James, L. I. His end came while he was in harness, so to speak, as he had ceased his activities but a few days before departing for Europe to obtain the rest he so much needed. But this trip, like the one he started upon just before the A. V. M. A. members made their trip to the Pacific Coast in 1910, was not to be, and he was forced to leave unfinished much work that he had planned. *In the midst of life we are in death.*

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	June 6-7, 1913.....	Birmingham.....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1914.....	141 W. 54th St.,	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.....	Sept. 1-2-3-4-5, 1913.	New York, N. Y.	Nelson S. Mayo, Blacksburg, Va.
Arkansas Veterinary Ass'n.....	January, 1914.....	Ft. Smith.....	J. B. Arthur, Russellville.
Ass'n Médéciale Veterinaire Française.	1st and 3d Thur. of	Lee. Room, La-	
"Laval".....	each month.....	val Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	S. Omaha, Neb.....	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n.....	Monthly.....	St. Joseph and vicinity.....	
California State V. M. Ass'n.....	Sept. 24, 1913.....	San Francisco.....	F. W. Caldwell, St. Joseph, Mo.
Central Canada V. Ass'n.....	Feb. and July.....	Ottawa.....	John F. McKenna, Fresno.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Syracuse.....	A. E. James, Ottawa.
Chicago Veterinary Society.....	2d Tues. each month.....	Chicago.....	W. B. Switzer, Oswego.
Colorado State V. M. Ass'n.....	May 28-29, 1913.....	Ft. Collins.....	D. M. Campbell, Chicago.
Connecticut V. M. Ass'n.....	August 6, 1913.....	Waterbury.....	I. E. Newsum, Ft. Collins.
Delaware State Vet. Society.....	Jan., Apl., July, Oct.....	Wilmington.....	B. K. Dow, Williamantic.
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Newark, N. J.....	A. S. Houchin, Newark, Del.
Genesee Valley V. M. Ass'n.....	2d week, July, 1913.....	Rochester.....	J. F. Carey, East Orange, N. J.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Atlanta.....	J. H. Taylor, Henrietta.
V. M. A. of Geo. Wash. Un'y.....	2d Sat. each month.....	Wash., D. C.....	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.....			A. T. Ayers.
Illinois State V. M. Ass'n.....	December, 1913.....	Chicago.....	Louis P. Cook, Cincinnati.
Indiana Veterinary Association.....	Jan. 14, 1914.....	Indianapolis.....	L. A. Merrill, Chicago.
Iowa Veterinary Ass'n.....	Pending.....	Pending.....	A. F. Nelson, Indianapolis.
Kansas State V. M. Ass'n.....	Pending.....	Pending.....	C. H. Stange, Ames.
Kentucky V. M. Ass'n.....	Oct. & Feb. each year.....	Lexington.....	J. H. Burt, Manhattan.
Keystone V. M. Ass'n.....	2d Tues. each month.....	Philadelphia.....	Robert Graham, Lexington.
Lake Erie V. M. Association.....	Pending.....	Pending.....	Cheston M. Hoskins.
Louisiana State V. M. Ass'n.....	Sept., 1913.....	Lake Charles.....	Phil. H. Fulstow, Norwalk, Ohio.
Maine Vet. Med. Ass'n.....	July 9, 1913.....	Belfast.....	Hamlet Moore, New Orleans, La.
Maryland State Vet. Society.....		Baltimore.....	H. B. Wescott, Portland.
Massachusetts Vet. Ass'n.....	4th Wed. each month.....	Young's, Boston.....	H. H. Counselman, Sec'y.
Michigan State V. M. Ass'n.....	Feb. 3, 4, 1914.....	Lansing.....	J. H. Seale, Salem.
Minnesota State V. M. Ass'n.....	July 9, 10, 1913.....	Albert Lea.....	W. A. Ewalt, Mt. Clemens.
Mississippi State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	G. Ed. Leech, Winona.
Missouri Valley V. Ass'n.....	June 30, July 1-2, '13.	Omaha.....	Wm. P. Ferguson, Grenada.
Missouri Vet. Med. Ass'n.....	July, 1913.....	Kirksville.....	Hal. C. Simpson, Denison, Ia.
Montana State V. M. A.....	Sept. 24, 25, 1913.....	Helena.....	S. Stewart, Kansas City.
Nebraska V. M. Ass'n.....	1st Mo. & Tu., Dec. '13	Lincoln, Neb.....	A. D. Knowles, Livingston.
New York S. V. M. Soc'y.....	Sept., 1914.....	Rochester.....	Carl J. Norden, Nebraska City.
North Carolina V. M. Ass'n.....	June, 1914.....	Wilson.....	H. J. Milks, Ithaca, N. Y.
North Dakota V. M. Ass'n.....	Aug. 6-7, 1913.....	Fargo.....	J. P. Spoon, Burlington.
North-Western Ohio V. M. A.....	Nov. 1913.....	Delphos.....	C. H. Babcock, New Rockford.
Ohio State V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	E. V. Hover, Delphos.
Ohio Soc. of Comparative Med.....	Annually.....	Upper Sandusky.....	Reuben Hilty, Toledo.
Ohio Valley Vet. Med. Ass'n.....			F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n.....	Fail, 1913.....	Oklahoma City.....	J. C. Howard, Sullivan.
Ontario Vet. Ass'n.....	1st Week in Feb. 1914	Toronto.....	C. E. Steel, Oklahoma City.
Pennsylvania State V. M. A.....	Sept. 16, 1913.....	Not selected.....	L. A. Willson, Toronto.
Philippine V. M. A.....	Call of President.....	Manila.....	John Reichel, Glenolden.
Portland Vet. Med. Ass'n.....	4th Tues. each month.....	Portland, Ore.....	David C. Kretzer, Manila.
Province of Quebec V. M. A.....		Mon. and Que.....	Sam. B. Foster, Portland, Ore.
Rhode Island V. M. Ass'n.....	Jan. and June.....	Providence.....	Gustave Boyer, Rigaud, P. Q.
South Carolina Ass'n of Veter'ns.....	Pending.....	Pending.....	J. S. Pollard, Providence.
South Illinois V. M. and Surg. Ass'n.....	Aug. 5-6-7 1913.....	Fillmore.....	B. K. McInnes, Charleston.
St. Louis Soc. of Vet. Inspectors.....	1st Wed. fol. the 2d		F. Hockman, Iola.
Schuylkill Valley V. M. A.....	Sun. each month.....	St. Louis.....	Wm. T. Conway, St. Louis, Mo.
Soc. Vet. Alumni Univ. Penn.....	June 18, 1913.....	Reading.....	W. G. Huyett, Wernersville.
South Dakota V. M. A.....		Philadelphia.....	B. T. Woodward, Wash'n, D. C.
Southern Auxiliary of California State V. M. Ass'n.....	Pending.....	Madison.....	S. W. Allen, Watertown.
South St. Joseph Ass'n of Vet. Insp.....	Jan., Apl., July, Oct.....	Los Angeles.....	J. A. Dell, Los Angeles.
Tennessee Vet. Med. Ass'n.....	4th Tues. each month	407 Illinois Ave.	H. R. Collins, South St. Joseph.
Texas V. M. Ass'n.....	November, 1913.....	Memphis.....	O. L. McMahon, Columbia.
Twin City V. M. Ass'n.....	Nov., 1913.....	College Station.....	Allen J. Foster, Marshall.
Utah Vet. Med. Ass'n.....	2d Thu. each month.....	St. P.-Minneapolis.....	S. H. Ward, St. Paul, Minn.
Vermont Vet. Med. Ass'n.....	Pending.....	Pending.....	A. J. Webb, Layton.
Veterinary Ass'n of Alberta.....			G. T. Stevenson, Burlington.
Vet. Ass'n Dist. of Columbia.....	3d Wed. each month.....	514 9th St., N.W.	C. H. H. Sweetapple, For. Saskat-
Vet. Ass'n of Manitoba.....	Feb. & July each yr.....	Winnipeg.....	chewan, Alta., Can.
Vet. Med. Ass'n of N. J.....	July 10, 1913.....	Jersey City.....	M. Page Smith, Washington, D. C.
V. M. Ass'n, New York City.....	1st Wed. each month.....	141 W. 54th St.....	Wm. Hilton, Winnipeg.
Veterinary Practitioners' Club.....	Monthly.....	Jersey City.....	E. L. Loblein, New Brunswick.
Virginia State V. M. Ass'n.....	July 10, 1913.....	Old Point Comf't.....	R. S. MacKellar, N. Y. City.
Washington State Col. V. M. A.....	1st & 3d Fri. Eve.....	Pullman.....	A. F. Mount, Jersey City.
Washington State V. M. A.....	June 1914.....	Walla Walla.....	Geo. C. Fayile, North Emporia.
Western Penn. V. M. Ass'n.....	3d Thu. each month.....	Pittsburgh.....	R. J. Donohue, Pullman.
Wisconsin Soc. Vet. Grad.....	July 16-17, 1913.....	Milwaukee.....	Carl Cozier, Bellingham.
York Co. (Pa.) V. M. A.....	June, Sept., Dec., Mar.....	York.....	Benjamin Gunner, Sewickley.
			J. W. Beckwith, Shallsburg.
			E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance: Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

IT PAYS TO USE GOOD ANTISEPTICS, more especially in veterinary practice to counteract the conditions under which a veterinarian meets many of his patients. Bacillol is in the front ranks. Write Bruno Grosche & Co., whose address you will find on page 26, and mention the REVIEW.

INCREASED SPACE AND GONE FORWARD. The Comparative Vaccine Laboratories, Inc., finding their space on page 17 inadequate for the proper listing of their "VETERINARY BIOLOGIES," have increased their space; and their patrons will find their interesting list now displayed on page 4, front forms. Mention the REVIEW when you write for information.

MANY VETERINARIANS WHO READ THIS will remember the interesting exhibit of the PITMAN-MYERS COMPANY at the recent meeting of the A. V. M. A. in New York; and by turning to page 3 (adv. dept.) front forms, you will find an interesting account of some of the things seen at that exhibit; and if you will drop a line to the Pitman-Myers Company telling them you are a reader of AMERICAN VETERINARY REVIEW, they will be pleased to send you samples and literature.

AMERICAN VETERINARY REVIEW.

NOVEMBER, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, 15th of September, 1913.

THE DOPING.—I do not know if this subject has received from veterinarians in America the attention that it has created here and that it deserves, and if the improper and fraudulent applications, that is made of it or the general influence that it may have from the point of view of equine stock raising, have been considered. At any rate, this last result of doping has been of sufficient interest to the *Congress Hippique*, which was recently held in Paris, to have it voted that "racing societies should prohibit and forbid doping, which prevents honest sincerity in races, favors frauds, compromises the health of horses as well as breeding interests and also the value and future of equine production."

The learned general inspector of the French veterinary schools, Prof. G. Barrier, was at that congress the promoter of this wish by the reading of a long dissertation on the subject of "Doping." After a few general remarks on the differences that exist between the stimulation obtained by the application of the spur or the use of the whip and that of a syringe of Pravaz or the administration of a bolus, Prof. Barrier passed a review of the various chemical products that will give the required stimulation, and whose administration is readily and easily concealed; and then exposed their after-effects and sequelae. He then fol-

lowed them by the consideration of the injury done to the organism and to the animal individuality.

The length of time during which the condition produced lasted, the peculiar and positive manifestations they gave rise to, their detection in the animal submitted to them, the analytic reaction by which their presence can be made evident in the saliva, by the use of one of the two methods, that of the reaction of Frohde with solution of molybdate of ammonia saturated in pure sulphuric acid or the reaction of Ferreira da Silva by nitric acid and concentrated alcoholic solution of Poash, were all powerfully dealt and presented by Prof. Barrier, whose authority tells of their value.

*
* *

At any rate, a long time before the seating of that congress the Secretary of Agriculture had appointed a scientific committee to study doping in its different forms and effects and to settle three essential questions.

1°—DO NORMAL HORSES, VIZ., THOSE WHICH HAVE NOT BEEN DRUGGED AND HAVE RECEIVED THE ORDINARY REGIME OF TRAINING, PRESENT IN THEIR SALIVA, BEFORE OR AFTER A RACE, ALKALOIDS THAT MIGHT BE ATTRIBUTED TO DOPING? The answer was negative. Nine horses having been submitted to the control of this test. No alkaloid being found in their saliva either before or after a race.

2°—DOES THE SALIVA OF AN ANIMAL CONTAIN, FOR A CERTAIN LENGTH OF TIME, TRACES OF ALKALOIDS ADMINISTERED IN THE COURSE OF A TREATMENT OR OF A REGIME ANTERIOR TO A RACE, AND IF SO, DURING WHAT LENGTH OF TIME? The experiments to answer this were carried on at the Alfort school. The horses were submitted to an ordinary regime, and received twice daily, for one week, high doses of alkaloids, strychnia, cocaine, heroine and caffeine. Analysis was made of their saliva after the last administration with the following results: After forty-eight hours nothing was found in any of the horses; after twenty-

four hours nothing was found in the animals that had strychnia, cocaine and heroine. The only saliva of the horse that received large doses of kola, presented the reaction of caffeine, which disappeared a few hours after.

The conclusions of this experiment were: That if an alkaloid is found in the saliva of a horse, the results of this experiment show that this alkaloid has been administered since forty-eight hours at least, and generally at least since twenty-four.

3°—In this question the experiments consisted in the reproduction of a true *doping* in the ordinary condition, viz., to administer the alkaloid stimulant in large doses shortly before the race and watch its elimination through the saliva. The drug was given to the animals used in experiments in bolus or subcutaneous injections. Between a half-hour or an hour after, the horse was run on a track of 3,000 meters, returned to his stall and his saliva collected.

The general result has been that the alkaloids administered were found, if the dose had been sufficiently strong and the saliva collected not too long after the running, the alkaloid remaining in various lengths of time. Cocaine was not found after an hour, heroine after two, strychnia was still found after five, and caffeine for nearly eighteen.

*
* * *

The committee resumed their conclusions as follows: The results of the experiments plainly prove the method of researches used to expose the practice of doping. This operation which, as it is known, consists in the administration to a horse that is to run in a race, a short time before the race, of alkaloids or of other substances liable to produce them in the organism. It has for its object the giving to the animal an artificial excitement, which supplies him with an advantage over the other horses running with him. The method of researches resorted to, detects the alkaloids in the saliva of a horse that has received the drug and only when it has had it shortly before the race. There is

none to be found if the horse has not had any, or if the doses have been only few and small, or if given a long time before the race. This means of controlling the proof of the *doping* can be depended upon as certain.

These experiments and the conclusions arrived at have already been recognized and admitted in several parts of Europe.

* * *

TRAUMATIC ARTHRITIS—ITS TREATMENT.—Very frequent in horses, where the many violent injuries to which they are exposed, especially in the extremities, explains its presence. Traumatic arthritis may be the result of serious accidents, which can end fatally, if, by proper and early treatment, its dangerous complications are not avoided. It is true that these cases are not all necessarily terminating with such bad results, which either imply a loss of services or perhaps a verdict of death, especially since the days when the therapeutic measures that we possess have rendered complications comparatively exceptional.

To protect, by careful disinfection, an injured articulation, is the first indication. To protect the synovial bursa against the invasion of germs, which may have been deposited, is one of the main objects. The use of tincture of iodine imposes itself, and with it the closing of the wound and the immobilization of the joint are the essential points, recommended in the *Revue Generale* by MM. Lesbre and Ball. If the synovia escapes, still normal and unaltered, a simple twisted suture of the wound is applied, if possible, to the synovial membrane only; especially when it has not been necessary to leave some lacerated or bruised tissues when the cleaning of the trauma was made. The object of this suture is to prevent secondary infections and the introduction of septic elements through the various movements of the animal. To limit those, a stiff blister is also applied. Immobilizing the joint co-operates to the occlusion of the synovial fistula and to some extent increases the asepsy of the lesions by the phagocytosis that it gives rise to. One or several applications of blister

ointment made in succession, and according to the indications, reduce the chances of complications. Wadding dressings will not prove as good as blistering for various causes; doubtful and less realizable asepsy: sometimes difficulty in applying it well, etc., etc.

*

*

*

If, notwithstanding those cares, the joint should become infected, and inflammation be declared, or if it exists already, when the synovia is running with a bad aspect or purulent, with all the manifestations of the well-known diseased process, what are the indications?

The ideal would be to evacuate the infected contents of the joint by repeated antiseptic injections. But it is a serious affair with our patients to open freely a joint and realize this evacuation, and it is only in hopeless cases that it is resorted to, at the risk of all the complications that may follow such serious interference.

Antiseptic washings with boiled water, oxygenated water, solutions of hermophenyl at 3 per cent., of permanganate of potassium at 1 to 1,000 may sometimes give good satisfaction.

But to those the authors give the preference to the use of caustic pencils, introduced in the depth of the fistula freely opened. These pencils impregnate the synovial membrane, render the articulation less inhabitable to the invading pyogenous germs. Sublimate and nitrate of silver pencils are common in general practice. But they have some inconveniences. Too caustic, they precipitate albuminoids and organic matters, forming with them compounds, which have no disinfecting power, and coagulums, under which infection keeps on its destroying work. Pencils of boric acid have been recommended, but their antiseptic power is rather limited.

Those of hermophenyl seem to be preferable to all of them. Many cases of arthritis have been treated very successfully by their use. Among those two are mentioned: one of temporo-

maxillary arthritis with bony, necrotic sloughs of the external condyle, and one with arthritis of the tarsal joint. Both of these cases were followed with rapid and complete recovery. Biniodine of mercury in suspension in petroleum oil has also been used with advantage.

In conclusion the authors of the *Revue Generale* say: "Traumatic arthritis is an affection that can most often be avoided at the onset, by treating all the traumatic lesions around the joint. Blistering, suturing of the wound, immobilization are recommended for their real efficacy. When phlegmasia has invaded the joint, the use of pencils that are not toxic or caustic, those that do not precipitate albuminoids, that give the synovial fluid a concentrated antiseptic condition and a continuous and active microbicid action must be the true treatment.

*

*

*

ADRENALINE IN VETERINARY MEDICINE.—With the exception of the few cases that I have spoken of in the REVIEW, as they have come under my eyes, I think it is proper to say that its use is more than limited in our medicine, and on that point is far from being employed as often as in human medicine. Indeed, in surgery its indications are quite numerous, and in internal pathology real advantages have been obtained by its uses. Yet we must not think that adrenaline is altogether ignored by veterinarians, as it has been employed to realize a local anemia, either alone or associated with cocaine, novocaine or stovaine, and also in some special affections, such as parturient apoplexy, where doubtful results have been reported; aseptic acute laminitis, anasarca, in which hypodermic injections of isotonic solutions of adrenaline diluted to the 1000th were first experimented with an apparent success, which did not last.

On account of the powerful cardiac tonic action that adrenaline possesses, its use might be suggested with digitalis or camphor, provided it is administered with the greatest prudence, viz., hypodermically, and fractioned in small doses, repeated at close

intervals, so as to realize a progressive action. Hence its indications in cases of insufficiency of the myocardium or in the vasomotor paralysis, such as is observed in the terminal period of some infectious processes, pleuro-pneumonia of horses, septicæmia, etc., or again as in human medicine against septic peritonitis.

These remarks of a German veterinarian, Mr. Thum, published in *Monatshefte für Tierheilkunde*, lead to the record of an observation taken from "a cow affected with septic peritonitis due to a volvulus." An exploring capillary puncture having given escape to a fetid, brownish exudate, evident proof of the presence of septic peritonitis, laparotomy was proposed. A rectal examination, previously made, had indicated the position of the volvulus, in the posterior region of the abdomen, near the entrance of the pelvis; the cause of the volvulus was made out by the introduction of the hand in the vagina and through an incision similar to that which is made in ovariectomy, sufficiently enlarged to allow the introduction of the fore-arm. It proved to be a fibrous band, which could be readily torn with the finger. This was followed by the immediate liberation of the strangulated intestine. The exploration of the peritoneal cavity revealed then the presence of a great quantity of inflammatory exudate, which had to be allowed to escape at once, with a large-sized trocar, introduced through the abdominal walls, 20 centimeters from the umbilicus. To allow the drainage of the peritoneum, the canula was left in place and secured on the back of the animal with tapes. Then, with a rubber tube passed in the vaginal wound, the abdominal cavity was washed with 25 litres of tepid isotonic solution of chloride of sodium. After having washed the viscera, this solution escaped through the canula. First it came out cloudy, but became clearer and even limpid towards the end of the operation. The canula was kept closed with cork.

At the same time an hypodermic injection of 5 c.c. of a solution of adrenaline was made on one side of the neck and repeated every 3 hours. The temperature was then 38° C., and pulse 120, scarcely perceptible. On the next day an injection of 12 litres of salt solution was again made, after the removal of 5 litres of

exudate, less fetid than the day before. The temperature was 39.6° C. and pulse 90. No rumination, some appetite. Adrenaline was again administered, five times during the day. The following day there was scarcely any exudate, the canula was taken out, and the internal washing stopped. Temperature 30.3° C., pulse 72, rumination returning, appetite improving, quick recovery.

Thum attributes to the adrenaline the great part of the success and recommends the introduction of this treatment in similar cases amongst ruminants and especially small animals, where septic peritonitis is invariably fatal.

It is certainly a good result that Thum has obtained, and his method is, to say the least, original; but whether or not it will enter in the domain of ordinary practice will remain a question.

* * *

FOOT AND MOUTH DISEASE IN MAN.—The question is one of actuality at present, since that scourge is prevailing more or less all over in Europe. Professor Cadiot has recently presented a long paper reviewing the subject before the Academy of Medicine in Paris.

The possibility of the transmission of foot and mouth disease to the human species, which for a long time has been considered as doubtful by the great majority of medical men and veterinarians, is to-day admitted almost by everyone. Notwithstanding some positive experiments and observations, the doctrine generally accepted until 1872 was that of the entire innocuity of the milk of cows affected with foot and mouth disease. In that year the disease prevailed in almost all Europe, and the severity was exceptional. H. Bouley mentioned then the great mortality that it caused among young animals fed with the milk of diseased cows, and he called the attention of physicians to the danger resulting from the use of such milk especially for children.

At that time numerous observations were brought out as proofs of the danger. Cow keepers and farm hands had been

inoculated through wounds of the hands or scratches on the face. A veterinarian (1886) has the disease after examining the mouth of diseased cows. A pig dealer takes it after skinning the cadaver of a calf dead from the disease (1880). Many similar examples are published. In 1887 Dr. David, Director of the School of Dentistry, writes "that the aphthous stomatitis of man and the disease of animals are one and the same disease; the first being transmitted by the second, and it is essential to obtain the interdiction of the sale of milk for human use, when it is coming from cows affected with the scourge, and also the sale of cream or white cheese made with milk from such animals."

Veterinary publications from Germany are numerous and corroborate those made in France. The use of virulent milk, of infected butter, the preparation of animals for sale to butchers, the care to be given to diseased animals are the most ordinary circumstances of contamination either to children or to adults.

In 1890 Bussenius and Siegel collected the facts relating to these questions and related more than fifteen hundred cases of contagion with a few deaths.

In 1893 Shantyr has transmitted foot and mouth disease to two calves on a healthy farm by inoculation with the saliva of a child suffering with typical foot and mouth disease. Bertarelli (1908) has obtained the same result in return to bovines.

Aphthous contagion from animal to man is then positively established. There are several instances published where in man the disease may assume an epidemic form. However, there are few of those where the diagnosis may not have been as positive as it might.

In 1902 the Academy of Medicine has expressed the wish that 'sanitary regulations ought not to allow the sale of milk from cows affected with foot and mouth disease, unless such milk be boiled or pasteurized at 85 degrees.'

Sterilization or heating at 90 degrees during quarter of an hour are measures applied to-day in most foreign countries; and that is as much to prevent contamination to man as to avoid all risk of extension of the disease by the milk or its derived products.

At any rate, these measures are always excellent hygiene. Imposed for children, they are recommended even for adults. Notwithstanding its white color and because of the conditions where it is gathered, milk is an unclean food, soiled at the time it is collected, soiled again by the manipulations it has to go through. Regulations, if properly applied, may reduce the soiling causes, but milk will not be purified, except by boiling or long heating, for several minutes, at the temperature close to 100 degrees.

*

*

*

COLORING MICROBES.—Many are the means of coloration resorted to in laboratories for the detection of microbes. But the methods used are more or less delicate or complicated, and a general, simple and quick microscopic technic of easy application would be of great advantage.

In the *Annales de Belgique*, Mr. P. Vander Elst calls attention to the mode of coloration realized by the use of Indian ink by Prof. Burri, of Bern, which makes it possible to obtain, so to speak, a *negative* coloration of the germs. With the other methods the microbe is colored; with Burri's, it remains clear, refringent on the black surface formed by the ink.

Upon a thin glass slide is placed a small drop of ink with an equal quantity of distilled water. To these is added as much as the head of a pin of the substance to be examined (blood, pus, any discharge, culture), etc. The whole is mixed on the slide and frottis are made, one or more if the quantity of the mixture allows it. The slide is left to dry, to the air or the alcohol lamp. When the preparation is dry, a drop of balsam is put on it. It is covered with thin lamella and is ready to be examined. It is necessary to avoid the use of too thick a quantity of ink, and that it should not exceed much the thickness of the microbe (?), hence the indication that the frottis be very thin. If the preparation, when examined, is black, it is because the ink is too thick. If the frotti is of a clear brown, the microscopic field shall not be

dark enough to show the refrigerency of the germs, which on a dark brown surface is shown very clear, the microbe is readily exposed in such a way that the bacteria of anthrax can be recognized with a magnifying power of 80 diameters. Fresh material is not necessary for making the frottis, and the preservation of virulent products in diluted antiseptic solutions does not prevent the clearness of the exhibition of the microbe.

A number of micro-photographs illustrates the application of the method made by Mr. Vander Elst, viz., piogenous staphylococci of mammitis in cows, tetragens from a nasal discharge on various cultures, ovoid bacterias of pasteurellosis, bacteridian anthrax, spirillum dentum found in dental caries of horses.

The method of Prof. Burri permits a rapid diagnosis that may render great services and cannot be ignored.

* * *

BIBLIOGRAPHIC ITEMS.—Reprints of the Studies of the Research Laboratory of Parke, Davis and Co. No. 31—*Studies on Hog Cholera*, by Walter E. King and Robert H. Wilson. Nos. 32 and 38—*The Virus of Hog Cholera*, by the same, F. W. Beslack and George L. Hoffman. No. 39—*Bacillus Bronchisepticus, Its Relation to Canine Distemper*, by N. S. Ferry, M.D.

Bureau of Animal Industry: Bulletin 161—*A Study of the Bacteria Which Survive Pasteurization*, by Henry Ayers and William E. Johnson, Jr. Bulletin 163—*The Life History of Habronema Muscae* (Carter), a Parasite of the Horse Transmitted by the House Fly, by B. H. Ramson, Ph.D.

Agricultural Journal of the Union of South Africa, June. "The Problem of Bovine Pest in Camels (Una questione molto sena di prophylaxy)," by Dr. Giulio Conti.

The West Australian, with the news of the appointment of Dr. E. A. Weston, G.M.V.C., B.V.Sc., as lecturer on veterinary science to the University of Western Australia. Graduate of the Melbourne Veterinary College and of the Dookie Agricultural College of Victoria. The doctor has already contributed much in his native land to the elevation of his profession.

TEAM WORK FOR VETERINARY LEGISLATION.

Beyond the first fifty years of the American Veterinary Medical Association, which is the mother organization of the American veterinary profession, what then? Dr. Mohler, in his presidential address in New York, at the golden jubilee, praised the "team work" of the legislative committee. By that he meant, palpably, the concurrent activities of the men composing that committee, under the chairman, for the advantage of the army veterinary service bill in the 62d Congress and the present one and the marvelous receptiveness of the profession to appeals in behalf of the bill, which, to use a football phrase in this, the football season, brought it as a team in massed play upon Congress sufficient, one would have thought, to pass the bill. Fifty years have gone by. The golden jubilee of the A. V. M. A. is over. Where is the army veterinary service?—fifty, nay, one hundred and fifty years behind the times; and it will remain there if we do not, by harder training and still better team work, carry the Hay bill (H. R. 4541) through Congress this winter.

There are three words in which are compressed the increments of success in this undertaking—organization, education, agitation.

Before a bill of this character can get through Congress there must be organization of all the elements which desire its passage and a union of all in the work of impressing Congress with its necessity. The bill goes before the national legislature for its enactment into law, as a demand of the profession and all the associated businesses, trades and professions with which it is interlocked. The veterinary profession, separate and alone, cannot pass this bill; the thousands of voters, of which it is composed, are not enough in themselves, unaccompanied, to get such a hold upon Congress as will force the passage of the bill. But when there are associated with us in this undertaking our allies in the businesses, trades and professions with whom we are associated, all are together a host to which Congress must listen. The militia of the states, the humane societies, the national breeding

associations—Morgan horse association and thoroughbred associations—interested in the improvement of the army horse, book, drug and instrument men, are illustrations of allied interests, the influence of whom is to be sought for the purpose. An analysis of our connections in professional life shows that our alliances are naturally in many directions, each having its organized power and at the same time its political strength. They are dependent in part upon us and we on them when political work is to be done. The organized veterinary body—national, state, city, institutional, fraternal—is great in itself politically; but greater when it gathers with it the host of voters among its allies to do the work of forcing the passage of the bill. Organization means the unionizing of all for the single purpose. Team work for veterinary legislation of this kind must mass all together and cause them to move upon Congress demanding attention.

But this organized power—the profession and its multitudinous allies—must be leavened by education into an understanding of the essential value of reform of the army veterinary service which is demanded. The bill is to be seen as valuable to us all. The profession as a whole is to profit by its passage, and this thought is working its way into the veterinary mind in a most gratifying way. We, as a profession, have made our mark in the United States Department of Agriculture; why should we not do the same, or something like it, in the Department of War? Why should the veterinarian be made fowl in one and fish in the other? If, when justice is done him in one department, he can rise to such distinction as he has done in the Bureau of Animal Industry and be applauded the nation over for his work, why should he not amount to something in the War Department if justice is done him there? Every member of the profession should be made to see the absurdity of the situation. Our friends and the friends of our friends must be taught these things.

Nor is this all. Knowledge of this matter is not sufficient. The intellect of man is notoriously cold as the ice-brook. The hearts of men must be won that they may feel the truth and earnestly seek the justice needed. The darkey preacher hit the

mark when he told of the cause of his success with his flock. "Yessir," he said, "I 'splains, then I 'splains; I 'spounds and 'spounds; then I puts in the 'rousal" (explains and expounds and then puts in the arousal). This plan is the precursor of success in the passage of the army veterinary service bill. The profession, the public with which it is connected, Congress, must have its necessity, its justice, endlessly explained until aroused to the final activity which brings its passage. G. S.

NEW ORLEANS IN 1914.

In both its September and October issues, the REVIEW expressed it as its belief that the 1914 meeting of the American Veterinary Medical Association would be held in New Orleans; and we are now in a position by the authority of President Marshall, to officially announce that the 51st annual convention of the A. V. M. A. will be held in New Orleans, December 28 to 31, 1914. That is surely a pleasant anticipation; for, aside from the good that the national organization will do for the cause of veterinary science by meeting in that part of our great country, as has been expressed by some of the most prominent members of the profession from the South, and the good that that section will do to the association and its members by having them there, there is the inspiring prospect of a week spent in that thriving metropolis of the South, which is distinctly one of the quaintest, most picturesque and cosmopolitan cities of America, embracing strong attributes of both the old and the new world. Many members of the American Veterinary Medical Association who were in attendance at the recent meeting in New York will remember Mayor Behrman's fascinating description of the city, in which he explained that Canal Street, which is 182 feet wide, separates the American from the old French quarter. The south, or upper side, is the American portion, and here are situated the big jobbing and business houses, hotels and restaurants, and boarding-houses of American type. The farther up

one goes the prettier this portion of the city becomes, finally beginning the beautiful "Garden District" with palatial and stately homes, exquisitely kept lawns and great groves of magnolia and oak. Below Canal Street is the French or Latin Quarter, where Creole business houses and homes hold almost undisputed sway. The restaurants of the French Quarter are famed for their delicious dishes and unexcelled cuisine the world over. And so we might go on and speak of the cathedrals, churches, theatres, hotels, etc., of this quaintly beautiful and picturesque city—a combination of Spain and Southern France dropped within our gates—but space being somewhat limited in this number, and considerable time intervening between the present and the time when our readers will be headed toward the Gulf of Mexico, this will suffice as an introduction.

REPORT OF THE SPECIAL COMMITTEE FOR THE DETECTION OF GLANDERS.—In this age of preventive medicine and campaign for the control of contagious diseases, there is probably no more important issue than the war against glanders in horses, so prevalent in the large cities. In our October issue we gave the personnel of the above committee on page 16; we also published on page 72 of that issue, a resume on the control and eradication of glanders presented to the American Veterinary Medical Association at the request of the "Special Committee." Having read that resume in the October number, our readers will be pleased to know that the more detailed report of the *Special Committee for the Detection of Glanders* will be found on page 218 of the present issue.

ARMY VETERINARY SERVICE LEGISLATION.—President Marshall of the American Veterinary Medical Association has exemplified his wisdom by reappointing Dr. W. Horace Hoskins chairman of the Legislative Committee of the A. V. M. A., and Chairman Hoskins has plunged into the work before the Sixty-third Congress with the same earnest determination that has characterized his former legislative work; and if the profession responds as it should, and undoubtedly will, to his appeal sent out under date of September 11th, House Bill No. 4541 will be successfully passed by Congress.

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF COLICS IN ANIMALS.*

BY L. A. MERILLAT, CHICAGO, ILL.

(Continued from October issue.)

Impaction of the Rumen: Impaction of the rumen is also a very common disorder in which surgery plays the most important role. It occurs both as a primary and a secondary affection. This form of stomach colic in its more formidable forms, yield only to surgical treatment. Medicants are often useless. It is cured either by rumenotomy, which will be described by Dr. W. J. Martin, or else by the procedure of Imminger, which consists of the installation of water directly into the rumen through a canula and then aspirating out the softened contents by placing the animal on its left side with the canula still in place. The patient is placed on an elevated platform made of two planks separated from each other just far enough so that the protruding canula will pass between them. It reminds one of emptying a barrel through a bung-hole. The liquid which runs out carries with it considerable of the solids, and besides, robs the rumen of harmful toxic products besides softening the mass better to facilitate its onward passage through the alimentary canal. The possibilities of this operation have never been tried out to any great extent in this country, but it seems to me to be destined to become a standard operation. The softening of the contents of impacted rumens by instilling water through a canula is not new, but the washing out process of Imminger is, I believe, an innovation.

Foreign Bodies in the Stomach of Dogs: Dogs and cats.

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

but particularly the former, often swallow indigestible objects that lodge in the stomach. Sometimes they obstruct the pylorus or if small enough may pass into the intestinal tract.

While such objects sojourn in the stomach, the usual signs of colic presented by dogs are wanting, but when they obstruct the pylorus or any part of the intestines, the restlessness, howling, whining, vomiting and bulging of the abdomen indicate that a prompt intervention for removal is demanded to prevent a fatal termination.

When such obstructions are known to exist and expulsion by other means is futile, few veterinarians hesitate to effect a removal by means of a direct celio-gastrotomy. Many of these operations have been performed and nearly all of them have been successful. We have done three such operations upon dogs and all recovered. One swallowed a molar tooth of a horse, one a hairpin and the other a silver dollar.

Foreign Bodies in the Rumens: Bovines are the ruminants most liable to swallow bodies, and that they do so with remarkable frequency is well known to all rural practitioners. The rapid ingestion of their food and the liability of their rations to contain foreign objects makes the bovine species most susceptible to this accident. Nails, pieces of wire, splinters of wood, knives, screws, bolts, nuts and in fact any of the small free objects found about stables which may accidentally get into the feed box or the manger constitute so many varieties of objects found in the rumen. Geo. B. Jones found a cow's rumen that contained a large quantity of binder twine and from time to time we hear reports of various miscellaneous objects gaining access to it. The objects may sojourn in the rumen for months without causing any disturbance that announces their presence, but not infrequently digestive disorders are produced by them, sometimes in the form of acute colic. More often, however, when they wound the wall of the rumen or reticulum they produce a local inflammation that spreads over the peritoneum very rapidly, and by perforating the diaphragm they sometimes cause thoracic inflammations, particularly of the pericardium. There is unfortunately no pathognomonic symptom at

an early stage upon which a diagnosis could be based, and on this account the surgeon seldom operates for their removal until it is too late.

Here again we have a serious condition that calls for a more careful study of symptoms in order that we may be able to diagnose the trouble at a time when surgical intervention could be depended upon to effect a prompt relief.

Impaction of the Crop of Fowls: The crop of fowls is very frequently overloaded to a serious extent, and is usually due to overfeeding of the young. The impaction may be of corn, oats, gravel, weed-seeds, peas or any of the small grains that constitute the feeds of these animals. Eaten dry, such grains may swell from their contact with the moisture of the crop and engorge it to a dangerous proportion. Young ducks are probably the most susceptible to this disorder. Whole flocks of young ducks may die over night after having partaken too freely of almost any kind of dry grains. I have found among my own animals that ducks are most difficult to raise successfully unless especial precautions are constantly taken to prevent this occurrence while they are young. The symptoms are bulging of the breast, difficulty of locomotion from the sheer weight of the mass which causes them to tumble forward and then on their sides. If not relieved, often they are unable to gain the upright position, and then die in a few hours from exhaustion. In older animals the disorder takes a less acute form. Chickens may live several days, dying from the inflammatory complications which supervene. The contents decompose and soon there is pressure gangrene of the walls.

In young ducks the crop may be evacuated by pressing out the contents in the forward direction, that is, the contents are pressed out through the mouth. Dr. F. H. Davis, a veterinarian of wide experience with ducks, once saved the majority of a large flock of young ducks that became stricken with this condition after having been given access to a lot of windfall berries that had been blown down from a mulberry tree. The flock was found in a serious condition almost immediately after having eaten the berries, and by promptly pressing the contents out through the

mouth he succeeded in saving the flock from being wiped out. Personally, I have had a similar experience with a flock of nine ducks that fell sick after having ravenously devoured a dry mash of corn and wheat bran.

In the older fowls, particularly chickens that have suffered for some hours, it is not possible to effect an evacuation by this means, but by performing simple section of the pouch (ingluviotomy) the patients can be saved when the walls have not been too badly damaged by complications.

These operations are not trivialities by any means, and deserve to be placed amongst our standard surgical procedures.

The Small Intestines: The small intestines are subject to very grave conditions which cause colics, and pain located in them is the most violent of all abdominal pains, and the more anterior the trouble is located the more intense is the pain. A diagnosis of colic in the small intestines is made by the intense agony the patient suffers and continues to suffer throughout. Whenever a horse throws itself about recklessly and violently and is beyond control, often falling to the floor with the full weight of the body, time after time without a moment of relief, except possibly when it rolls into dorsal condition against the wall, it is pretty safe to diagnose colic in the small intestines, and the antero-posterior location may be judged by the intensity of the pains. The duodenum and jejunum cause a more intense pain than the ileum, other things being equal.

The small intestines, especially of large animals, are not affected with conditions that can be successfully managed by surgery, and they are only mentioned here to carry out our plan of differentiating colicky pains. Our loss, however, in this connection is not great, and should not be discouraging, because bowel surgery for intrinsic conditions are pretty hopeless anywhere. Even the human surgeon despairs at the necessity of cutting into the intestinal tract, and if we are denied the benefit of such interventions, we are not denied much that is successful. I know that surgical literature records enterotomies, enterectomies and approximations with a recklessness that would lead a reader

to believe that these are but commonplace, every day trivialities, but when one scans statistics of mortalities and untoward sequelae we veterinarians may be thankful that our animal patients are not suitable subjects for such operations.

The diseases of the small intestines found in domestic animals with sufficient frequency to be called common diseases are: 1st. *Enteritis*: Enteritis may be local, from a local obstruction, but more often it affects a more extensive area. The whole tract, including the stomach and large intestines may be affected. It probably always has its origin in faulty alimentation, but early in the course of the pain bacteria play an important role and thus produce a condition that no surgical operation could benefit. 2d. *Obstruction*. Obstruction from fibrous forage or unnatural food may cause obstruction at one point or over a considerable portion of the small bowels. Circumscribed obstructions may cause pouching of the gut at the point affected and thus leave a place for future accumulations. In dogs clay, sand, or foreign bodies may lodge in them, and in ruminants foreign bodies may pass the four stomachs and lodge at or behind the pylorus. Here again we cannot successfully operate for them even if we should eventually succeed in diagnosing these cases. 3d. *Volvulus and Invaginations* are common enough to warrant a very close study of the early symptoms. And it is a pity we do not diagnose them early because here we have conditions which could be relieved by extrinsic manipulations and would, therefore, be less hazardous than operation requiring invasion of the rumen. I regret to say that I have never been able to find these conditions except at the postmortem examination.

The Large Intestines: Pain in the large bowels is easy to differentiate from pain in the stomach or small intestines. It is always of a milder type and often intermittent. May last for days. In practically all of the autopsies I have had the opportunity to hold on animals dead after long sieges of colic, the incriminating lesion was found in the large bowel. The pain may be acute in the early stage, but this soon gives way to one that is milder and lasting. Sitting upon the haunches, dog-like, points

to trouble in the large bowel. The common sign of turning the nose toward the flank is also one that is seen more often in disorders of the large bowels than of the small ones, although too much dependence must not be placed upon this symptom, because the same manifestation is seen in almost any form of colic. The act of holding the nose at the flank for some moments at the time is, however, a certain indication of a grave condition, like strangulated hernia, volvulus, invagination or fatal local obstruction of some other character. In stomach colics there is always the telltale dilatation of the nostrils and local sweating about the foreparts of the body, while in colon disorders these symptoms are wanting after the bloating has been relieved. These rules of course apply only to the early stages of the affection. An impaction at the sternal flexure may give rise to these stomach symptoms, but the differentiation is soon made when stomach catheterization fails to afford relief, and then there is always the rectal exploration upon which we can depend to make an accurate diagnosis of the exact seat of the obstructions in all instances.

The disorders of the large bowels in which surgery play an important role are: 1st. *Acute Intestinal Indigestion*. This is sometimes, although by no means always, associated with acute indigestion in the stomach. In this condition, the flatulent colic of the old school veterinarians, the bowels are overwhelmed with food or with tainted food. The formation of gases from fermentation is sometimes so rapid as to cause death in short order if relief is not promptly given, and often the damage done to the intestinal walls by the stretching produces a condition in the colon analogous to the dilatation of the stomach previously described. The exhaustive muscularis being unable to contract fails to move the accumulated mass. Very often, I regret to say, this state of exhaustion is aggravated if not actually caused by the administration of eserine or arecoline. These drugs tax the muscularis severely by causing futile contractions against the solid contents, and thus leave the bowels helpless, vapid, paralyzed at a crucial period of the disease when a little peristalsis would be mighty precious.

Treatment: The simple operation of intestinal puncture, entercentesis, as we have been prone to call it, is the cherished bit of colic surgery that must be depended upon as the curative expedient. It is strictly a veterinarian's operation, very old and very simple, but no less the valuable because of this. The value of horses saved by this simple operation would be well worth recording. When this operation has been done appropriate medical treatment per os must follow. *Analgesics?* No. Cannabis Indica, chloral, opiates are so many harmful agents that should have no place in the treatment of this condition, or in fact any form of colic for that matter. I have, during the last few years, followed with wonderful success the treatment of the late Dr. N. P. Whitmore, of Illinois, which consists of the administration of ether in large doses. Whitmore would administer to his patients sick with acute indigestion, gastric or intestinal, a full half pint of ether as a drench. I have been told on good authority that he sometimes drenched a horse with one-half pint and even a full pint of ether from the original package without dilution. This we have modified to 6 ounces, given with linseed oil. The effect of ether vapor upon intestinal fermentation is phenomenal when given in large doses. A purgative of aloin or aloes given as soon as the acute symptoms have passed will act as a stimulant to the colon some hours later, at a time such stimulation is needed to prevent obstipation.

The second disorder of the large bowels is impaction of the colon—a condition consisting of the accumulation of more or less solid masses of aliment throughout or at different points of this large folded compartment. It may follow acute intestinal indigestion or may arrive as an initial condition. Where horses are fed largely upon dry fodder for months, it is very common, and horses worked hard and fed well to keep up their condition are also very susceptible. In hard worked city horses it often follows periods of idleness where the ration is not reduced, and horses idle from some locomotory disability may fall victims while unable to take sufficient exercise to keep up the intestinal activity.

Pathologically, impaction of the colon as seen in horses is a partial or complete paralysis of the walls of the colon. The word "paralysis" applies best to this condition because the muscularis after being overwhelmed into a state of enfeeblement fails to contract.

The symptoms are quite characteristic. Indeed, there is little excuse for not making an early diagnosis in every case. The pain is mild and at first intermittent. The right flank compared carefully with the left is slightly bulged and sometimes bloated. During the first hour or two feces are voided frequently in small quantities, but this ceases as soon as the floating colon is empty. On auscultation of the right flank the borborygmus is found feeble or absent, and on exploration per rectum there is little trouble found in locating the solid contents of the colon. When the pain is more acute the patient may sit, dog-fashion, or at times stretch out as a male does in the act of urination. The absorption of toxic products may cause some elevation of temperature in rare cases early in the course of the disease, but more often there is but little rise in the body temperature until the patient is in a hopeless condition. I would always interpret fever with colonic impactions as an exceedingly grave symptom.

Treatment: When impaction of the colon is found to exist, no time must be lost in waiting for the action of slow acting purges, and powerful drugs acting in transient stimulants to the muscularis are exceedingly harmful. A horse affected with a formidable impaction of the colon that survives a dose of eserine, survives in spite of the treatment and not through it. Linseed oil and also aloes are probably the best drugs for this condition, but are useless in serious cases because there are no contractions of the muscularis to distribute it to and through the accumulated mass, and as for eserine I am certain it is only helpful in cases which would have recovered without medication. The walls are too weak to cope with the heavy, dry, voluminous mass impacted within them and a transient stimulation such as is produced by eserine only adds to the enfeeblement, by impelling futile contractions.

We are now using for this condition three forms of direct treatment: 1st. *Colonic flushings per rectum—high enemas*. While we have not entirely overcome the difficulties attending attempts to wash out the large colon of horses, we are becoming more and more successful in injecting large volumes of water into it. We admit there is no easy method of washing out the colon. The long floating colon of the herbivorous animals stand as a real obstacle against the instillation of water into the larger compartment anterior to it, but since the veterinarian is thus deprived of a mighty effectual curative experiment, any manipulation that would surmount this obstacle would be an invaluable addition to the treatment of many grave disorders. We need colonic flushing in animal therapy and we need it badly. Fatalities among animals sick with digestive disorders would be greatly reduced if we could inject water into the colon of herbivora as easily as in that of the carnivora and of humans. Curing impactions of the colon would then be a triviality.

Our method of forcing water into the colon is not perfect. We are still in need of a better instrument to prevent reflex from straining, but we have shown to our entire satisfaction that by patiently forcing water at a temperature of 112 Fahr. into the floating colon by means of a hose and pump with the rectum packed with substances to prevent free reflex of the water, large quantities can be passed into the colon. While the floating colon is still full of feces not much headway can be made, but when these are expelled, a stream may be made to flow forward through this gut into the large colon. Straining to expel the water injected cannot be entirely controlled, but we have found that since all of the water injected is not successfully expelled by the patient in these seizures, some will find its way into the colon if the operation is persistently continued. We have found also that an animal narcotized with drugs administered hyperdermically or anaesthetized with chloroform will take large volumes of water by a little patient forcing, and also that water at the proper temperature (not too hot nor not too cold) is less apt to cause straining. We once ruptured a horse's floating colon by

applying too much force to the pump, which fact shows the operation is not without its hazard.

Our method in use to-day, but which we hope to improve when we have finally invented the proper instrument, is as follows: A hose is passed into the floating colon as far as possible and then the rectum is packed with cotton wads until it is full. Expulsion of the cotton is prevented by holding the hand firmly against it within the anus. Then hot water previously prepared in abundance is pumped into the hose until straining is produced. As soon as the straining paroxysm ceases, the pumping is resumed. At first, only a small quantity may be retained, but if the operation is persistently repeated, large quantities will eventually find its way forward. The operation is a mussy affair, I admit, but it is no less valuable on this account. The Kellogg syringe, which contains an inflatable rubber bulb to prevent reflux is probably an improvement over this more crude mechanism of ours, but it too must be held in with the hands and the reflux is by no means controlled by it. There is need of a hose having an inflatable bulb as large as a football that is so arranged that it can be retained in the rectum by means of a harness. We are now having such an affair constructed, but since it has never been completed, we cannot of course venture any opinion as to its merits at this time.

Instillation of Water into the Stomach: The second operation we use against impactions of the colon is the instillation of copious drafts of water into the intestines through the stomach with the stomach tube. If the stomach is full, but this is seldom the case, it should first be washed out and then 6 to 8 gallons of water injected into it. The water promptly finds its way into the intestinal tract, sometimes as far as the caecum. By supplying the intestines with these liberal draughts of water from two directions, there are indeed few cases of impactions that will not yield when the diagnosis is made before the muscularis has been too seriously weakened and a peritonitis has already developed.

Flushing the Colon Through the Abdominal Wall: The

third is the direct instillation of water or oil into the colon through the abdominal wall by means of a trocar or canula. The right flank is punctured in the usual manner and after the trocar is removed, a small rubber hose is attached to the canula and the instillation done by pouring the liquid into a funnel attached to the other end. The intestines will slowly take liberal amounts of fluids in this manner. The procedure is harmless and if done at an early stage, is very effectual.

When the contents are known to have been softened by these methods, eserine may be given with safety and with splendid results.

I am aware these symptoms of attacking impactions are not new. They have, however, never become standard operations, and in view of the fact that they are proving phenomenal in the hands of those who have become expert in the essential manipulations, this attention to them has been deemed worth while.

Torsion of the Colon: Torsion of the colon is a common enough accident in horses, and of course always fatal. Attempts to correct this misplacement by manipulations have never been successful. Some have told that this may be done by rolling the patient while the arm is held in the rectum. At my hands this has always failed. Direct handling of the organ through a flank laparotomy has likewise been an unsuccessful procedure with me. I have always found the colon too weak to stand the traction required to lift it with its heavy contents. Latterly the procedure of Hartwig, of Wisconsin, for torsion of the uterus of cows has occurred to me to be applicable to the colon as well. I have, unfortunately, not met a case since Hartwig announced his method publicly, but believe we now have a method of untwisting a colon without much trouble. The success of course will depend upon a diagnosis made before the organ is damaged by disease.

Hartwig has performed some operations for torsion of the uterus in cows with splendid success by making an abdominal section in the right flank large enough to admit both arms. In this I see the secret of success in handling the twisted colon, for with both hands the organ can be lifted without danger of tearing its walls.

In conclusion, I venture to say that the possibilities of successful instrumentation of the intestinal tract and stomach of animals are by no means meagre. Although the operations are of a different order than those splendid invasions of the human surgeons, we have a broad field which we have thus far failed to cultivate as fruitfully as is possible, and from which may be selected a wealth of operations that cure colics heretofore regarded as fatal.

PHYSICIANS PAY TRIBUTE TO VETERINARY SCIENCE.—In an article in *The American Journal of Clinical Medicine* for September, on page 773, entitled "Help to Make Smooth the Road to Motherhood," Dr. E. B. Young, of Baker, La., says, "I will say that the source from which I probably have received the most information outside of my own profession has been the veterinarian. He then states that it has been his good fortune to have a close personal acquaintance with three first-class veterinarians, "one of whom," he goes on to say, "has an international reputation, and than whom there is no better. I speak of W. H. Dalrymple, M. R. C. V. S., professor of veterinary science at the Louisiana State University. I never met any of these gentlemen without adding something to my store of useful practical information." Another recognition of the benefit of co-operative study between the physician and the veterinarian is made manifest in an article entitled "Oxygen Subcutaneously" under the head of "Correspondence," by Dr. J. A. Burnett. Read it, and give Dr. Burnett the benefit of your experience through the columns of the REVIEW.

NATIONAL ASSOCIATION BUREAU OF ANIMAL INDUSTRY EMPLOYEES.—Through the courtesy of Dr. S. J. Walkley, secretary of the above association, we recently received a copy of the proceedings of the first annual meeting at Chicago in May last. It was a three day meeting, with evening sessions, and an immense amount of work was accomplished. The REVIEW commended the organization of this association at the time of its inception, and predicted a great future for it, which has already been realized, although it is still young. We note, in reading the proceedings, that the Chief of B. A. I. is also much impressed with the work of the organization, and regret that they were not received in time to abstract more fully from them.

ADDRESS BY PROF. WILLIAM A. EVANS, CHICAGO, ILL.*

Mr. Chairman, Ladies and Gentlemen: About two years ago the New York Milk Committee recognizing the chaos that prevailed in the milk business, and recognizing that one of the reasons for this chaos was a lack of standards, decided that they would appoint a Milk Standards Commission, this commission to be composed of men who had had experience with milk in different ways, in order that each might bring to the work of the commission his point of view, and with the idea that that presentation would be of service in arriving at conclusions. The idea was that, this report having been made, ordinances and laws would be adopted, drawn along the general lines of the report, and that if then it should be found that there were features of the report that did not work well, modification would ensue. It was not thought that one general statute, or one general ordinance, could be drawn applicable to all parts of the country, since that which has made the milk question difficult to handle has been the fact that it does not enter into general commerce; the reason being that there is so much of variation between the different communities and so many things that make it impossible for the supply of one community to be available to any large extent for any other community; or, in other words, one of the factors that has worked against getting milk on the same commercial basis that other commodities are on is the fact that milk conditions are flavored or tintured by local conditions. Nevertheless it was thought that gain would be had if there could be a uniform thread, a certain thread of uniformity, on which variation would be made to suit the peculiarities of different communities. This was as much as the New York Milk Committee had in mind in the selection of this Milk Standards Commission.

*An extemporaneous address delivered before the American Veterinary Medical Association on the morning of the last day's session at New York, September, 1913.

Some two hundred names were submitted for membership on the commission, and out of that number approximately twenty were selected, most of whom have remained with the commission during its two years of existence. The membership commission, as at present constituted, is composed of Dr. B. L. Arms, who at that time was an assistant in the department of biology and public health of the Massachusetts Institute of Technology, director of the laboratories of the Health Department of Boston, now director of the laboratories of the Health Department of the State of Oregon; Dr. John F. Anderson, director of the Hygienic Laboratory of the United States Public Health Service, Washington, D. C.; Prof. H. W. Conn, director of the Bacteriological Laboratory of the Connecticut State Board of Health; Prof. Conn, of Wesleyan University; Dr. E. C. Levy, Health Officer of Richmond, Va.; Dr. A. D. Melvin, Chief of the Bureau of Animal Industry of the Department of Agriculture; Dr. Wm. H. Park, Director of Laboratories, Department of Health of the City of New York; Mr. Raymond A. Pearson, President of the State College of Agriculture of Ames, Iowa; Dr. M. P. Ravenel, Director of the Hygienic Laboratory of the University of Wisconsin; Prof. M. J. Rosenau, Professor of Hygiene and Preventive Medicine, Harvard Medical School; Mr. Chester H. Wells, Health Officer, Montclair, N. J.; Prof. Henry C. Sherman, of the Department of Chemistry, Columbia University, New York City; Dr. L. L. Van Slyke, of the Department of Chemistry of the New York Agricultural Experiment Station; Dr. Charles E. North, Consulting Sanitarian, a member of the New York Milk Committee and Secretary of the Commission; Dr. J. N. Hurty, Secretary of the State Board of Health, Indianapolis, Ind.; Dr. Joseph S. Neff, Director of the Public Health Department of Philadelphia, Pa.; Dr. John S. Fulton, Director of the State Department of Health, Baltimore, Md.; and myself.

As you will notice, the veterinarians' interests are represented by Dr. Melvin, and I think fairly also by Dr. Ravenel; the health departments, by several secretaries of state boards of health, by health officers of large communities—for instance, Chicago, New

York and Philadelphia; of middle-sized communities, such as Richmond, Va., Dr. Levy; and of small communities by Mr. Wells, of the Department of Health, of Montclair, N. J. The National Health Service is represented by Dr. Anderson. Various agricultural colleges are represented by Mr. Pearson, President of the Iowa State College, and by Prof. Stocking, of Cornell, and Prof. Van Slyke. After two years of deliberation the committee issued a report with the understanding that that report would be distributed by the Public Health Service. It was so distributed in May, 1912. After many thousands of copies had been distributed, and after requests for opinions had been replied to from many different sources, the commission was again called together with the view of amending the report in the light of the year's experience.

The meeting for the consideration of the report, for its revision, with a view to final publication, was held at Richmond in April. The report was issued on August 22, 1913, and is to be found in the Public Health Reports for that date. I had hoped to have a considerable supply of those reports here this morning. The New York Milk Committee have just telephoned that they have not had the supply from Washington that they expected, but that a moderate number, in fact a small number, of copies would be in the room before we adjourn this morning. They suggested that those anxious to secure copies write to the United States Public Health Service, Washington, D. C., for a copy of their report, dated August 22, 1913. If you prefer, however, if you will furnish me a list of the members I will endeavor to have a copy of the report sent to each member. I will transmit that list to Dr. Anderson, of the Public Health Service, who has the matter in charge.

Now I am going to read a few of the subjects covered in this report, those that are of particular interest, I take it, to the gentlemen who constitute this organization; and then I am going to speak to three of those subjects—not to the report in its entirety, but to three of the matters that are covered in the report.

The sections that I have marked to be read are the follow-

ing: The preamble begins with these words: "Proper milk standards, while they are essential to efficient milk control by public health authorities and have as their object the protection of the milk consumer, are also necessary for the ultimate well-being of the milk industry itself. Public confidence is an asset of the highest value in the milk business. The milk producer is interested in proper standards of milk, since these contribute to the control of bovine tuberculosis and other cattle diseases and distinguish between the good producer and the bad producer."

I will now read some more along the same line. The reason for introducing this is that I am presently going to say something about the failure of the milk business to develop as it should in some measure as the result of a lack of public confidence in milk. On this general subject of the lack of uniform conditions in the different communities they say:

"These are the result of a study of the printed rules and regulations of the cities of the United States and of foreign countries and represent an immense amount of work on the part of the special commission to which the task was assigned. Some communities are in a position to adopt all of these rules and regulations at the present time, while other communities will be obliged to adopt a few rules at a time, as public sentiment and local conditions warrant. It is realized that some of the rules will have to be modified to meet local conditions."

One of the criticisms that the report has been subject to is the fact that the rules better fit the conditions in large cities than they do those in small cities. That would mean this, that it is possible for a small city to have a better milk supply than a large one. As a general proposition I think it is true that small communities have worse milk supplies than large communities. That is by reason of the fact that they make no effort to control their milk supplies. When they do make such efforts, it is found that it is relatively easy to control them in small communities as compared with large communities. Therefore certain bacterial standards to which I shall presently refer, whilst they are the bacterial standards that we have to compromise on when we are deal-

ing with the large community, should not obtain in the small community; the small community can do infinitely better.

You will understand that the milk as it comes from a cow is occasionally free from bacteria; it is usually of low bacterial count. Occasionally there is found a cow giving milk containing but a few thousand bacteria as it issues from the udder. As a general proposition, however, the bacterial content of newly drawn milk is low. There are certain ferments that develop in milk shortly after it is drawn, the nature of which we know very little about, which are, however, bactericidal; they are something more than restraining in their action on bacteria; they seem to be bactericidal, so that at the end of about six hours there are fewer bacteria in the milk than there were at the time it was drawn, that is, in milk that has been well kept. This ferment action is a self-limited action, so that after about six hours it ceases to operate and bacterial multiplication begins in earnest. The communities therefore, that have their cows close up to their babies, that have the mouth of the baby in close juxtaposition to the cow, have no great difficulty in securing milk of a low bacterial count. Whenever you begin to interpose between the baby and the teat any sort of foreign circumstance or happening, you increase the number of bacteria that you must have in milk, from which there seems to be no practical escape. If the milk is produced on the premises where it is consumed, if any sort of effort is made to secure healthy cows, such as make for hygiene, under those circumstances the milk is very much cleaner, very much better and very much more wholesome than milk that is produced under any other circumstance. If the milk is produced a few miles away in the country, so that it needs to be hauled but a short distance, handled but by few people—the people who produce and the people who consume, let us say—but one wagon intervening between the cow and the baby, a double delivery, let us say, so that much of the milk is consumed before it is six hours old, and all of it is consumed before it is twelve or fourteen hours old, under those circumstances you can demand and can secure very much lower bacterial counts than are set by this

commission. You will understand that a bacterial standard is not an absolute thing; it is merely a measure by which the sources of the milk are to be judged; and if a milk that is but a few hours old and that has been handled by but few people has a high bacterial count, it means that the conditions under which it was produced and under which it has been kept, have been almost unspeakably bad. If, however, the milk is a day or more old, has been hauled fifty or more miles, has been hauled in a railroad train and by two or more wagons, it may have a hundred thousand bacteria without it indicating that there has been gross negligence at any point along the line. Therefore these bacterial standards are to be taken in this light: a community that cannot secure better than two hundred thousand as its standard of bacterial count, will be fair or moderately fair to the children who consume cow's milk, if they allow that to be the standard of their community. If, however, a community has cows kept on the premises, or cows within four or five miles of town, a double daily delivery of milk, it would not be at all fair to those babies if the health department were to allow a count of two hundred thousand.

CLASSIFICATION OF MILKS.

"There is no escape from the conclusion that milk must be graded and sold on grade, just as wheat, corn, cotton, beef and other products are graded. The milk merchant must judge of the food value and also of the sanitary character of the commodity in which he deals. The high-grade product must get a better price than at present. The low-grade product must bring less."

I do not know how it came about, but there is considerable public opinion that milk should be classed as milk, and that no adjectives should be applied to milk. This is difficult for me to understand, because in the whole range of commerce there is not another thing within my knowledge that is bought and sold that is not graded and classified. It is true of cotton, where we have all sorts of titles and adjectives applied to it; it is true of

wheat; it is true of meat; it is true of lard; it is true of calico; it is true of silk; it is true of iron, of steel, of cars and of elephants. Everything that is bought and sold is graded and classified except milk; and why anyone could assume that this particular commodity could thrive on a commercial basis, violating this which is a proven and fundamental rule of commerce, I have never been able to understand. It seems to me that one of the necessities, if the milk business is to thrive, is that milk should be made to conform, just as far as it is possible for it to conform, to the ordinary commercial lines, and where it does not automatically conform to such commercial lines there should be such regulation and control as would cause it to travel in those grooves where it has been demonstrated that business best prospers.

BACTERIA.

The subject of bacteria in milk received more attention than any other matter brought before the commission. The commission recognizes that bacteria in milk in the majority of instances indicate dirt, or lack of refrigeration, or age, while in the minority of instances the bacteria of disease may be present. The routine laboratory methods of examining milk have as their purpose only the control over dirt, refrigeration and age, and it is a rare thing for a laboratory to undertake the examination of milk for the bacteria of disease because of the extreme difficulties in detecting them. The more efficacious method of protecting milk from infection by the bacteria of human contagion is by medical, veterinary and sanitary inspection, and by pasteurization. Milk with a high bacteria count is not necessarily harmful, but when used as a food, particularly for children, is a hazard too great to be warranted. Milk with a high bacteria count, therefore, should be condemned. Milks with small numbers of bacteria are presumed to be wholesome, unless there is reasonable ground for suspecting that they have been exposed to contagion.

I now come to the subject of "Laboratory Examination for Bacteria."

I am going to digress far enough to say that we are not infrequently disturbed by the perfection of certain laboratories; for instance, Dr. Mohler's laboratory. We get an idea that the laboratory is not a laboratory unless it has the equipment in men and in instruments that these better developed laboratories have. We are stopped by this conception of a laboratory from undertaking laboratory work in our smaller communities, those communities that cannot afford the more complete equipment that is to be found in such laboratories. Let me suggest that there is no community that is large enough to afford a public school that is not large enough to afford a laboratory for the examination of milk, at least in so far as sanitary considerations are concerned. The equipment required is simple, and for certain procedures the technical training required is hardly worthy of consideration. As you, gentlemen, very well know, the simple Babcock instrument has now carried the testing of butter fat in milk to the farm, so that it is done by the farmer's son, and not infrequently by the thoroughly untrained farmer himself. There is a fair method of testing the sanitary quality of milk that is even simpler than the application of the Babcock test, and that is the dirt test—the filtering of a given quantity of milk through a filter for the purpose of disclosing the amount of dirt that is in that sample. For instance, the milk having been thoroughly agitated, a pint is removed therefrom, and that pint is filtered, and the amount of dirt caught on the filter is held for purposes of demonstration and education. Milk can be filtered through a pledget of cotton; it can be filtered cold—however, it filters better warm; it can be filtered with no apparatus at all, except a funnel and a pledget of cotton. However, that is rather slow; we will be better satisfied all around if we have a little bit more apparatus than that. In the city of Chicago we have been using an ordinary plain, simple filter with a pledget of cotton in the bottom of the filter; that filter runs into a vacuum bottle, and in that vacuum bottle a small degree of vacuum or low-air pressure is maintained. You can get enough vacuum by merely attaching this vacuum bottle to a current of running water, so that

any place that has running water has about all of the equipment that is needed for the making of the dirt test. For a while we had our men equipped with a large rubber bulb that would hold about a pint, and they would create a slight degree of vacuum in that bottle by simply exhausting the air with the bulb. I am going into these little details, because they show that not much of apparatus is required for the dirt test. Certainly it would be easy indeed to equip the laboratory of your public school with the Babcock test; and you could not do a better thing for the milk supply of your community, and for the people of the community, and for the children themselves, than to have them periodically and systematically examine the milk supplies of your community with the Babcock test. Some of you here, I am sure, have had experience as school teachers. You will understand the advantage from the pedagogic standpoint of using for the purposes of study something in which there is a human or personal interest. Therefore your children in school will learn very much more about the question of fat and certain chemical questions if they use things that they bring from their homes than if they use things that appeal to them altogether from a didactic standpoint. The same thing is true of the dirt test. There is no reason why the students of the public schools should not regularly and systematically apply the dirt test to the milk supply of their community.

Now, a bacterial count—that is to say, a quantitative count—is a matter of somewhat greater difficulty. It requires a little bit more of equipment, but it requires very little more of equipment. If the counts are to be made at incubator temperatures, an incubator can be constructed at very small cost. You are to remember that the microscope required for a quantitative bacterial count is a very low power microscope, and therefore the expensive microscope equipment that you ordinarily have in mind when you think of bacterial work is not required for the quantitative counts of milk, or water, or other substances, in a community. Without going into further detail, it would be easily possible for the senior grades in your local schools to carry out

bacterial examinations of the milk supplies of those communities. I mean now quantitative examinations, and that is about all that we put very much stress upon. As a practical matter, administrative matter, we do not get very much from qualitative examinations of milk.

There are a few bacteria, pathogenic for the human animal that it has been demonstrated are found in milk. The best known, of course, of these is the tubercle bacillus. You heard Dr. Park tell his story last night, how they found that about 12 per cent. of the milk supply in New York City contained tubercle bacilli. Quite uniformly those tubercle bacilli are virulent for guinea pigs. You heard his further statement that the proof, such as is obtainable on such a question as this, is that a large percentage of those tubercle bacilli are virulent for the human animal; a larger percentage of them are bovine tubercle bacilli, virulent for children in the mid-period of child life; many of them are human tubercle bacilli, virulent for younger children, for babies, and those in the first two years of life, producing pulmonary tuberculosis in those cases, and a small percentage are virulent for adults. There is some evidence, and I think quite conclusive evidence, that typhoid bacilli have been found in milk. Of course we have that presumptive evidence that is quite conclusive and has been so accepted by the courts, found in the development of typhoid fever amongst people who have been consuming a certain milk, in the handling of which milk, at some point or other, there has been probably infection with typhoid. Of course that evidence is quite conclusive to fair-minded people. It is generally accepted as conclusive when offered in courts of law. At the same time it is nothing more than presumptive proof. They have, however, demonstrated that the typhoid bacillus has been found in milk, making use of the Weidel reaction. Then there is septic sore throat, in which I think the proof is quite definite that certain of the streptococci are responsible for the spread of the disease; but just the relation between those streptococci and the streptococci derived from the udder of the cow has not been established.

Now, that is about as much as we know about the pathogenic bacteria in milk. It is not of very much practical or administrative value, as I said a while ago, as a general proposition. After you have had the lapse of the period of incubation, the development of the disease, the number of days required for purposes of the inquiry, the condition responsible for the infection of the milk has terminated so that it is not of any practical value from that standpoint at all. But the use of the bacterial standard as a method of measuring the standards, the sanitary standards, the hygienic standards, the probabilities of proper care in the production of milk on the part of those who are responsible for its production and for its handling, the advisability of using the bacterial count for these measuring and estimating purposes I think has been fully established.

I have something here on the subject of "Laboratory Examinations for Bacteria." It is proposed to grade milk into the following three grades:

"*Grade A—Raw Milk.* Milk of this class shall come from cows free from disease as determined by tuberculin tests and physical examinations by a qualified veterinarian and shall be produced and handled by employees free from disease as determined by medical inspection by a qualified physician, under sanitary conditions, such that the bacteria count shall not exceed 100,000 per cubic centimeter at the time of delivery to the consumer. It is recommended that dairies from which this supply is obtained shall score at least 80 on the United States Bureau of Animal Industry score card.

"*Pasteurized Milk.* Milk of this class shall come from cows free from disease as determined by physical examinations by a qualified veterinarian and shall be produced and handled under sanitary conditions such that the bacteria count at no time exceeds 200,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacteria count shall not exceed 10,000 per cubic centimeter at the time of delivery to the customer. It is recommended that dairies from which this supply is obtained shall score 65 on the United States Bureau of Animal Industry score card."

I may say that one of the most extensive discussions that we had was as to the score required on the Animal Industry score card. There were men who believed that those scores were too low. The question was finally settled, however, when we bore in mind the difference in the personal equation of the scorer; the 90 of one man is about the same as the 45 of another man; and if we put a score that was too high, the result would be that some fellow would merely lower his standards of scoring, and in that way bring up his average score.

"Grade B. Milk of this class shall come from cows free from disease as determined by physical examinations, of which one each year shall be by a qualified veterinarian, and shall be produced and handled under sanitary conditions such that the bacteria count at no time exceeds 1,000,000 per cubic centimeter. All milk of this class shall be pasteurized under official supervision, and the bacteria count shall not exceed 50,000 per cubic centimeter when delivered to the consumer.

"It is recommended that dairies producing Grade B milk should be scored and that the health departments or the controlling departments, whatever they may be, strive to bring these scores up as rapidly as possible.

"Grade C. Milk of this class shall come from cows free from disease as determined by physical examinations and shall include all milk that is produced under conditions such that the bacteria count is not in excess of 1,000,000 per cubic centimeter.

"All milk of this class shall be pasteurized or heated to a higher temperature, and shall contain less than 50,000 bacteria per cubic centimeter when delivered to the consumer. It is recommended that this milk be used for cooking or manufacturing purposes only.

"Whenever any large city or community finds it necessary, on account of the length of haul or other peculiar conditions, to allow the sale of Grade C milk, its sale shall be surrounded by safeguards such as to insure the restriction of its use to cooking and manufacturing purposes."

Now, gentlemen, I think I will read to you one other section under the title, "Cows."

" Cows.

" *Requirements.*—1. A physical examination of all cows shall be made at least once every six months by a veterinarian approved by the health authorities.

" 2. Every diseased cow shall be removed from the herd at once, and no milk from such cows shall be offered for sale.

" 3. The tuberculin test shall be applied at least once a year by a veterinarian approved by the health authorities.

" 4. All cows which react shall be removed from the herd at once, and no milk from such cows shall be sold as raw milk.

" 5. No new cows shall be added to a herd until they have passed a physical examination and the tuberculin test.

" 6. Cows, especially the udders, shall be clean at the time of milking.

" 7. No milk that is obtained from a cow within 15 days before or 5 days after parturition, nor any milk that has an unnatural odor or appearance shall be sold.

" 8. No unwholesome food shall be used."

Milk from cows reacting to the tuberculin test can be pasteurized and sold under proper supervision.

In addition to those requirements certain recommendations are made.

" RECOMMENDATIONS.

" 1. Every producer shall allow a veterinarian employed by the health authorities to examine his herd at any time under the penalty of having his supply excluded.

" 2. Certificates showing the results of all examinations shall be filed with the health authorities within ten days after such examinations.

" 3. The tuberculin tests shall be applied at least once every six months by a veterinarian approved by the health authorities, unless on the last previous test no tuberculosis was present in the herd or in the herds from which new cows were obtained, in which event the test may be postponed an additional six months.

"4. Charts showing the results of all tuberculin tests shall be filed with the health authorities within ten days of the date of such test.

"5. The udders shall be washed and wiped before milking."

Now, gentlemen, I think I will close because I notice that we have come to the hour for your section meetings, with a brief discussion of the question of the welfare of the milk industry, something concerning the factors that are responsible for the fact that the milk industry is not developing co-ordinately with the other industries. In the first place, there is not a particle of organization, as we know the word in these later years, applied to the milk business. At no stage of production or of selling is the milk business organized in the way that other businesses are organized. The men engaged in the business quite generally have resisted efforts to grade and classify milk. They have hesitated at the educational effort necessary to re-educate their people, so that they would appreciate the differences between good and bad milk, as expressed by the letters A, B, C, or other designations. They have preferred that the ordinary custom should remain of calling milk *milk*, and making good milk sell in competition on the same basis with poor milk. One of the reasons why there has not been the development of the milk business that there should have been is because of the periodic outbreaks of distrust and fear that result from periodic demonstrations of the ability of milk to carry bacteria capable of causing infection. Beyond doubt the incoming of pasteurization will reduce the number of milk outbreaks, but, nevertheless, there will be from time to time articles in the papers, telegraphed widely throughout the country, emphasizing the dangers of drinking milk, and the non-discriminating public will refrain from drinking all kinds of milk until that particular fear has been allayed.

By reason of the fact that the milk business is a pretty good-sized business, we lose sight of the fact that it ought to be a very much larger-sized business; we lose sight of the fact that it has not grown and has not developed as have other businesses in the country, in spite of the fact that it should have grown and should have developed more than those other businesses in the country.

Milk is more nearly an ideal food; it finds a broader range of use than most any other food. It has many different possibilities aside from those for which it is at present employed. I have not time to develop those possibilities. I am going to put this single illustration, and then leave you for your section work.

When the milk commission was en route to Richmond, in April, they were invited to stop off at Annapolis and visit the government dairy in connection with the institute there. We found that several years ago they had a good deal of minor digestive disorder. They investigated the cause of that disorder. They found that from time to time they had outbreaks of typhoid fever. A cursory investigation was made, and after a while it occurred to them to look into the general milk supply of that community, and particularly into the milk supply that was drawn on for the academy. They found that the academy supply was quite bad. The government was finally persuaded to put in its own dairy. When they put in the dairy they found but one location available, and that was quite near the hospital. The doctors at the hospital did not want the dairy near their hospital. They said: "It will fill our hospital with flies." In reply to that the people in charge of the dairy said: "Well, if you will look after your flies, we will look after our flies, and we will promise not to disturb your hospital with the dairy flies if you will promise not to disturb our dairy with the hospital flies." They built in a dairy that was very clean. In order that there might be no flies they took proper care of the manure. They not only went after the flies in the stable, but they distributed fly-traps out over the pasture in order to catch those flies that in fair weather stayed out of doors. In consequence of that fact they have been very much more disturbed by hospital flies than the hospital has been disturbed by dairy flies. Immediately the milk is drawn it is chilled. They have a chilling apparatus in close proximity to the place where the milk is drawn. Then the milk is kept cold and is consumed by the students in a relatively short while. The cows are tuberculin tested. They are examined by veterinarians from the Bureau of Animal Industry. In fact, the entire installation has been under the direction of the Bureau of Animal In-

dustry. The milk goes over there to the boys with an exceedingly low bacterial count, clean and cold, and it is consumed within a few hours.

Now, the point to my story is this. There are 700 students in that academy. In olden times there were 120 sick-days per month on an average, from minor digestive disorders. You will understand we are not talking now about babies; we are talking about great, husky, double-jointed naval cadets, men whose digestive apparatus can better withstand disease than can the digestive apparatus of the average adults of the community. By sick-days we mean days excused from duty. One hundred and twenty sick-days a month would mean that each student would have an average of about one-fifth of a sick-day during the month. When they put in this milk the number of sick-days from digestive disorders materially decreased, so that in no month since that was installed have they had more than twenty sick-days from minor digestive disorders, and they have had no illness that was even presumptively a milk-born illness. That is to say, they have decreased the excuse rate to as low as one-sixth of what it formerly was, at the maximum. That is to say, the maximum rate since this new milk was used is but one-sixth of the rate before it was used. There have been months when there have been no sickness days and other months with five and six and seven and eight days off duty, as compared with 120. Twenty was the worst month that they have had, and that happened to be a month when they had a lot of football games, taking the boys off the campus.

The second point is this: Those 700 boys consume 300 gallons of milk a day. Now, there is not a community in America that has one-quarter of that quartage. There is no community in America that has anything like that quartage, and if there was a grade of milk on the market that was comparable with the grade of milk that is being supplied to the Naval Academy students, the consumption of milk would be very much increased over the amount as at present consumed. Of course there would develop along with that other uses for milk that would still further increase the amount consumed, and of course that would carry with it a still greater development of the milk industry.

THE USE OF MILK CULTURES OF *B. BULGARICUS* IN THE PREVENTION AND TREATMENT OF BACILLARY WHITE DIARRHEA OF YOUNG CHICKS.*

BY L. D. BUSHNELL AND OTTO MAURER, MANHATTAN, KANSAS.

Metchnikoff's discoveries of the influence of the lactic ferments upon the intestinal flora in health and disease opened a wide field for the treatment of the various disturbances caused by a deviation of the intestinal flora from the normal. The principles of this form of bacterial therapy are too well known to be reiterated here. Though this cheap and simple form of treatment has rapidly conquered an important place in human medicine, it has, until recently, been almost entirely ignored by the veterinarian. The favorable results which Standfuss reported on the use of yoghurt in epidemic calf-diarrhea suggested to the authors the use of this preparation in the treatment of white diarrhea in young chicks.

This disease, the one most dreaded by the poultry farmer, and which makes poultry raising unprofitable on some farms, has been thoroughly investigated by L. F. Rettger, of the Sheffield Scientific School, Yale, in connection with Stoneburn, formerly of Storr's Experiment Station. Their results were met with scepticism by many, but have since been fully confirmed by Gage and Jones. In Bulletin 74, the latest report of the Storr's Experiment Station, on bacillary white diarrhea, this disease is aptly described as follows:

"As in many other diseases, the symptoms may vary within certain limits in the individuals affected. We do not wish to be understood that all of the following symptoms will be observed

* From the Bacteriological Laboratory of the Kansas State Agricultural Experiment Station.

in every chick suffering from bacillary white diarrhea; but almost all of them will be apparent in epidemics of any considerable size.

“The earliest deaths may occur within a very short time after hatching, without any prominent symptoms, excepting perhaps weakness and lack of vitality. The characteristic whitish discharge from the vent soon makes its appearance in the flock, the time depending, without doubt, upon the virulence of the organism and mode of infection. The discharge may be slight or profuse, in color white or creamy, sometimes mixed with brown. The voided matter has a more or less sticky or glairy character. It may simply streak the down below the vent or may cling to the down in sufficient quantity to seal up the vent. This is the condition that poultry-men designate as ‘pasting up behind.’ This latter condition, however, is not necessarily indicative of white diarrhea.

“The chicks soon become listless and sleepy, inclined to huddle together and remain under the hover much of the time. They seem to lose appetite and do not eat much. Frequently when they attempt to take food, their action is more or less mechanical. The wings begin to droop or project slightly from the body, with feathers ruffled. In acute cases the eyes are closed, and the chicks become indifferent to everything that goes on about them. Many of the chicks peep or chirp constantly, the sound being shrill or weak, according to the strength of the individual. Frequently when endeavoring to void the excreta, the chicks utter a shrill twitter, apparently a cry of pain. The breathing may be labored, the abdomen heaving with each breath. Occasionally one may note a certain amount of gasping.

“During the progress of the disease the chick may die suddenly while still fairly strong. When the disease is prolonged the chicks gradually waste away, becoming weaker and weaker until they are scarcely able to support their own weight. In this stage they will often be seen to rest against foreign objects for support, standing with legs braced apart, squatting or lying utterly helpless.

" Frequently the chicks take on the appearance which poultrymen call 'short-backed.' The back seems to shorten and the abdomen to protrude out of proportion, causing the chick to look 'stilty' as compared with one of normal development. This condition Woods accurately describes as follows:

" 'The weakling is almost always big-bellied, the abdomen protruding to the rear so that it bunches out behind, well out of line with the vent, with the result that the chick looks as if the tail-piece and backbone had been pushed forward and in, just above the vent.'

" With few exceptions, the deaths from typical bacillary white diarrhea occur while the chicks are under one month of age. After this a few straggling deaths may be expected, and if complications set in, a high mortality may be observed. The chicks which have had bacillary white diarrhea seem to be greatly weakened in constitution, and fall an easy prey to disorders which would be resisted easily by normal chicks.

" Those which survive remain more or less stunted in their development. Frequently they are misshapen, with long beaks and 'crow-heads,' and with imperfect feathering. In every way they impress one as being weak and lacking in vitality. This condition may persist indefinitely, or the bird may slowly regain vigor and vitality and finally make fairly satisfactory development.

" Findings upon autopsy:

" *Crop*—Empty or partially filled with slimy fluid or with food.

" *Lungs*—Apparently normal. (Tubercles not observed.)

" *Liver*—Pale, with streaks and patches of red. The congested areas are usually large in size. Occasionally epidemics will be met with in which the liver is more or less congested throughout. In such cases the portion of the stomach lying in contact with the liver is inflamed.

" *Kidney and Spleen*—Apparently normal.

" *Intestines*—Pale and for the greater part empty. A small amount of dark grayish or brownish matter frequently present.

"*Ceca*—With few exceptions but partly filled with a grayish soft material. Only occasionally cheesy or firm contents.

"*Unabsorbed Yolk*—Usually present, varying in size from a pea to a full-sized yolk. The color may vary from yellow to brownish green or nearly black. In consistency there is also much variation. Frequently it looks like custard and again it is more or less dry and firm. Unless the chick has been dead for some time, the yolk is not putrid but merely stale.

"The chick as a whole appears more or less anæmic and emaciated. The muscles of the wings, breast and legs may be almost completely wasted away."

To establish the presence of white diarrhea in a mature flock, an examination of the ovaries of all the birds that are killed for the market is of great service and will generally reveal the existence of the disease. In the Storr's Experiment Station Bulletin 74, ovaries infected by *B. Pullorum* are described "as being made up of ova of two distinct types, the normal and the abnormal. The normal may be of varying sizes and resemble those of perfect ovaries. The abnormal may also vary as to size, but often as many as twelve or more ova which are of uniform size may be seen. When quite small the white diarrhea cysts are less angular and irregular than those which are larger. The color of the larger ova may vary greatly. They are usually more or less mottled. Some are light in color; others much darker; almost all shades of yellow and brown may be seen. Occasionally the color is so dark and of such a character as to suggest gangrene."

"The larger abnormal ova or cysts are usually quite angular, and of a firm consistency. Sometimes they are so compressed as to appear flattened. The contents of the white diarrhea ova are, as a rule, quite characteristic: They consist chiefly of a solid, cheesy matter, which is usually permeated by a clear, amber-colored fluid. The bacterium of white diarrhea may be recovered from the contents with ease."

The bulletin from which this description is taken contains color plates of normal and infected ovaries that admirably bring out the points of diagnostic importance.

The hens with infected ovaries frequently lay infected eggs and the chickens hatched from such eggs invariably fall a prey to the disease. These chicks that derive the disease through the infected ovaries of their mothers form the most prolific source of infection for their originally healthy companions. We can, therefore, easily realize the grave danger represented by the widespread distribution of day-old chicks, which has become so popular during the last few years. There should be a law compelling all breeders that sell baby chicks or eggs for hatching to have their breeding stock tested for the absence of white diarrhea. This can be done by the examination for *B. Pullorum* of a number of eggs from the hens that are to be used for breeding. The macroscopic agglutination test of the fowl's sera against *B. Pullorum* has also been found very reliable by Jones. This test, which is easily done, will become a valuable means for diagnosing and eradicating white diarrhea. It is only a question of time when the agricultural experiment stations and commercial laboratories will equip their bacteriological laboratories for the diagnosis of white diarrhea by isolating *B. Pullorum* from eggs, by agglutination tests and by the examination of the ovaries. In the meantime poultry-men should carefully examine the ovaries of all killed birds for evidences of white diarrhea; they should get rid of infected flocks as soon as possible, and by no means use their eggs for hatching. Only such breeders whose flocks have been found to be free from white diarrhea, by competent bacteriologists, should be permitted to sell baby chicks and eggs for hatching. It may be some time yet before our legislatures pass laws to that effect. In the meantime the Agricultural Experiment Station or the powerful American Poultry Association should grant certificates to those breeders who comply with their rules ensuring the absence of white diarrhea from their flocks. The existence of such certified poultry farms and the great superiority of their products would soon induce all breeders to submit their flocks to examination by experts and to do their best to prevent the introduction of the disease into their flocks. In this manner the tremendous losses

which the poultry industry sustains from this disease could be reduced to a minimum.

The causative organism of bacillary white diarrhea has been named *B. Pullorum* by Professor Rettger, its discoverer. The following are the most important morphological and cultural characteristics of this organism:

B. Pullorum is a rod, .3 to .5 by 1 to 2.5 m., rounded ends. It occurs singly or very rarely in chains. It is non-motile, does not produce capsules or spores. It stains readily and uniformly with ordinary aqueous anilin dyes, and is gram-negative. The colonies on agar are discrete, at first resemble the translucent pin-point colonies of the streptococcus. They enlarge later; upon gelatin the colonies resemble those of the typhoid bacillus. Little growth occurs upon potato. Milk is a suitable medium, but there is little change, no coagulation and no proteolysis.

Physiology—The organism is aërobic and facultative anaërobic. The optimum growth occurs at about 37° C. Dextrose and mannite are fermented, with the production of both acid and gas. Maltose, lactose and saccharose are not fermented. Indol is not produced.

From its characteristics we see that *B. Pullorum* belongs to the colon-typhoid-dysentery group of organisms.

Judging from the inhibitive action which *B. Bulgaricus* exercises on this group, a study of its effect in white diarrhea seemed quite promising. Numerous investigations have been made on the effect of *B. Bulgaricus* on the intestinal flora and their putrefactive products. They have been reviewed by Einhorn, Wood and Züblin, whose paper is highly recommended to all interested. I should like to review here only a few observations on the effect of *B. Bulgaricus* on *B. Coli* and other intestinal bacteria that are of special interest in this connection. Katschi found *B. Coli* only very rarely in the feces of Bulgarian shepherds that habitually consume large quantities of yoghurt. He also found a rapid decrease of *B. Coli* in the feces of patients under treatment; this made itself noticeable as early as one week after *B. Bulgaricus* was fed.

T. v. Kern who studied the effects of the products of *B. Bulgaricus* on *B. Coli* *in vitro* and *in vivo* also found a marked antagonizing and inhibitive action of *B. Bulgaricus* upon *B. Coli*.

Cohendy found *B. Bulgaricus* in the feces within three to five days after feeding was begun. After eight days the organism was constantly present; it could occasionally be found even twelve days after its introduction had been discontinued, while the lactic acid bacteria from ordinary sour milk could maintain themselves for only two days.

Belowonsky studied the influence of food, abundantly infected with *B. Bulgaricus*, on the intestinal flora of mice. His conclusions are summarized as follows by Kendall: "The Bulgarian ferment modifies the normal intestinal flora of mice by a general alteration in their character and by elimination of putrefactive forms. First, there is a diminution in the total number of bacteria as well as a lessened virulence of the organisms in the feces when these are introduced intraperitoneally or subcutaneously into other animals. Second, the action is not attributable to the formation of lactic acid alone, but also to certain products inhibitory in nature, formed by the bacilli themselves. Third, the organisms become more or less established in the intestine about the tenth day in adult mice and persist without further re-inoculation for a considerable but variable interval of time. Fourth, the cultures seem to have exerted a beneficial action upon the mice, particularly on those infected with the organisms of mouse typhus; in this case the results are due exclusively to the lactic acid."

Duclaux found an enormous decrease in the total number of bacteria in the feces under the influence of yoghurt. After feeding this preparation for four weeks, the number of colonies growing from 0.1 gr. of feces was reduced from 26,000,000 to 12,000, the latter being mostly lactic acid bacteria. Wejnert observed a decrease to one-fourth the original number of colonies in the feces, when ordinary sour milk was fed, while the numbers went down to one-twentieth (average) when Metchnikoff's lacto-bacillin milk was given.

Other authors, as Herter and Kendall, do not report as favorable results. Their experiments were carried on with monkeys and are summarized as follows: First, by feeding a Rhesus monkey for two weeks exclusively on milk fermented with *B. Bulgaricus* (but containing also some yeasts) it was possible to maintain an acid reaction throughout the digestive tract. The acid reaction was more pronounced above the ileo-cecal region than at this region or below it. The acidity decreased progressively from the ileo-cecal region to the anus. Lactic acid was detectable at every point in the digestive tract that was tested, the reaction growing less marked below the ileo-cecal region.

Second, exclusive feeding for two weeks with milk fermented with *B. Bulgaricus* failed to establish the predominance of this organism in the ileo-cecal region or in the large intestine. In the latter situation the number of bacilli of this type was relatively small and decreased towards the anus. Thus in the regions characterized by most active putrefaction the lactic acid bacilli failed to establish themselves in relatively large numbers.

It may be of interest in this connection to inquire into the most important morphological bio-chemical features of *B. Bulgaricus*. This organism derives its name from its prominent rôle in the fermentation of the Bulgarian sour milk, called yoghurt. *B. Bulgaricus* measures about 1×4.5 m., has rounded ends and occurs singly and in pairs, rarely in short chains. It stains well with the ordinary aniline dyes and retains Gram's stain, unless it be old when it often represents a granular and mottled appearance. The organism only grows in media that contain carbohydrates. While its growth on artificial media is very meagre, it grows luxuriously in milk, producing a finely flocculent soft coagulum with little expulsion of whey. Bertrand and Weissweiller, who studied the chemical effect of *B. Bulgaricus* on milk, found that less than 10 per cent. of the casein is peptonized and utilized as a bacterial food. A small amount of the fat is saponified. Practically all of the lactose is transformed into lactic acid, of which 25 g. are frequently produced per liter. Acetic, formic and succinic acids are produced in small amounts

only; in general, their total does not amount to more than one-half gram per liter.

Even if *B. Bulgaricus* would grow in abundance only in the gizzard, stomach and small intestines, as suggested by the studies of Einhorn, Wood and Zublin, it might render the valuable service of killing or at least suppressing the *B. Pullorum* that have gained access to the food or drink of the chicks. In this manner the access of *B. Pullorum* to the large intestines might also be prevented, though *B. Bulgaricus* might fail to multiply or maintain itself there. In the digestive tract of the newly born chicken the *B. Bulgaricus* stands a much better chance to gain a foothold than in the digestive tract of adult animals. The earlier *B. Bulgaricus* is fed to the chicks, the better are the chances for its becoming the dominating habitant of the digestive tract, since there is as yet no established flora present with which the *B. Bulgaricus* has to compete. In those chicks that were hatched from infected eggs the lactic acid therapy cannot be expected to result in benefit. In these cases the *B. Pullorum* has already reached the circulation by the time *B. Bulgaricus* can be fed and, of course, *B. Bulgaricus* or its products cannot exert any influence on the *B. Pullorum* in the circulation and organs. To be effective, therefore, the sour milk has to be fed before septicemia is established. The earlier it is fed, the better are the chances for its suppressing the proliferation in the intestinal tract of *B. Pullorum* and therefore for preventing a bacteremia due to this organism. With these considerations in mind the following experiments were arranged:

During the first part of August eighty-one chicks were hatched in an incubator from one hundred and fifty white leghorn eggs that were secured from a poultry farm, on which white diarrhea did not exist. The chicks were uniformly divided according to size and apparent vigor into three lots of twenty-seven each.

TREATMENT OF THE DIFFERENT PENS.

Pen I.—Twenty-four hours after hatching a few drops of a young culture of *B. Bulgaricus* in milk was placed into the

mouth of each chick by means of a medicine dropper. For the following four weeks a frequently renewed milk culture of *B. Bulgaricus* was constantly kept in the pen, so that the chicks always had access to it. The cultures were prepared by heating fresh, sweet milk for one-half hour to 100° C. and, after cooling, inoculating it with *B. Bulgaricus*. The cultures were kept in the incubator for not less than 24 hours, nor more than 48 hours. An unpleasantly acid flavor was generally produced within 48 hours. The curd was soft, not much whey being expelled. The strain of *B. Bulgaricus* used was obtained from the University of Wisconsin.

When the chicks were about 40 hours old, they received a few drops of a 24-hour bouillon culture of *B. Pullorum* (obtained from Prof. Rettger) by means of a medicine dropper. From now on, 24-hour bouillon cultures were mixed with the mash, the organism being fed in this manner until the chicks were one week old.

Pen II.—When twenty-four hours old, the chicks received a few drops of a 24-hour bouillon culture of *B. Pullorum* by means of a medicine dropper. Next morning when the chicks were about 40 hours old, a culture of *B. Bulgaricus* in milk was sprinkled before them. The white spots of curdled milk immediately attracted their attention and they were soon engaged in picking them up.

The feeding of *B. Pullorum* and *B. Bulgaricus* were continued as described for Pen I.

Pen III.—The 24-hour-old chicks were given a few drops of a 24-hour-old bouillon culture by mouth. For one week *B. Pullorum* was fed as described for Pen I. This pen did not receive any cultures of *B. Bulgaricus*.

These experiments were begun on August 23 and continued for eight weeks, or until October 21. The chicks were looked over every day to detect deaths, and they were weighed at the age of four, six and eight weeks. The following tables give the results of the experiments:

SEPTEMBER 23.

	Number Pen.	Original Number.	Number Alive.	Number Dead of Disease.	Per Cent. Dead of Disease.	Total Weight.	Average Weight.
Pen I.....		27	20	6	22	6.73	.34
Pen II.....		27	14	11	41	5.49	.39
Pen III.....		27	10	17	63	2.97	.30

OCTOBER 7.

Pen I.....	27	15	10	37	7.94	.53
Pen II.....	27	9	16	60	5.46	.61
Pen III.....	27	4	23	85	2.2	.56

OCTOBER 21.

Pen I.....	27	8	17	63	6.03	.75
Pen II.....	27	6	19	70	5.02	.84
Pen III.....	27	3	24	89	2.55	.85

These data show in a striking way the beneficial effect of *B. Bulgaricus* in white diarrhea. As might be expected, this effect is especially marked when the sour milk is administered before infection with *B. Pullorum* has occurred. This is clearly expressed by the low mortality of Pen I. as compared with Pen III. The difference in mortality in the two pens is 41 per cent. after four weeks, and 48 per cent. after six weeks, in favor of Pen I. From the sixth week until the end of the experiment, that is, eight weeks after the chicks were hatched, the mortality records show a less striking difference, it being only 26 per cent. less in Pen I. than in Pen III. This increased mortality in Pen I. during the last four weeks is probably due to the cold and damp weather to which the chicks were exposed from October 7 to October 21. This influence of the weather could make itself felt more clearly in Pen I. than in Pen III., because on October 7 there were fifteen chicks left in the first pen, while only four, probably the most hardy and resistant ones, were left in Pen III. Perhaps the high death rate in Pens I. and II. during the last two weeks might have been prevented by feeding *B. Bulgaricus* for a longer period. Jones found recently that *B. Pullorum* may under certain rare conditions produce fatal septicemia in mature stock. Perhaps these conditions were present during the last two weeks of our experiment. Unfortunately the exact cause of

the deaths occurring during the last two weeks could not be ascertained, since one of the authors was absent at the time. So it must be doubtful whether these deaths are due to the unfavorable weather, or due to some subsequent infectious disease. There is no doubt, however, that the deaths occurring earlier in the experiment were due to white diarrhea. All the symptoms described above were present and *B. Pullorum* was identified in the bodies of all the chicks examined. The disease was also considered an excellent example of white diarrhea by a poultry-man who had experienced many outbreaks of the disease.

Pens II. and III. were infected with *B. Pullorum* when they were 24 hours old; Pen II. did not receive *B. Bulgaricus* until 16 hours after infection with white diarrhea, while Pen III. did not receive any sour milk at all. In this manner we intended to determine whether *B. Bulgaricus* is able to prevent fatal septicemia after *B. Pullorum* has had some time to establish itself in the digestive tract of the birds. The results were most encouraging. At the end of six weeks the mortality in Pen II. is 26 per cent. lower than in Pen III., though after eight weeks this figure is reduced to 19 per cent., probably for the reasons just given for the increased mortality in Pen I. during the last two weeks.

We see that the mortality in Pen I. is considerably lower than in Pen II. This probably is due not only to the feeding of *B. Bulgaricus* before infection with *B. Pullorum* occurred, but may be partly explained by the fact that the birds in Pen I. were infected with white diarrhea 16 hours later (at an age of 40 hours) than the birds in the other two pens. Since the period of greatest danger from white diarrhea lies within the first 48 hours and is passed after birds have reached an age of four days, this difference in the time of infection of Pen I. and the other two pens may be partly responsible for the great difference in mortality.

Whether the beneficial effect of *B. Bulgaricus* is due to the inhibitive effect of *B. Pullorum* of the lactic acid produced, or to a direct antagonizing action by a specific ferment (such as, for instance, *B. pyocyaneus* possesses against *B. anthracis*), or simply

to a substitution and crowding out of *B. Pullorum* by *B. Bulgaricus*, which finds more favorable conditions for growth than the former, could only be decided by extensive further investigations. Rettger suggests another possible explanation. The sour milk seems to greatly stimulate the vitality and growth of the chicks. By increasing the vitality of the chicks, their resistance to white diarrhea may be increased. This agrees with the observation that white diarrhea is especially liable to attack, and produces the worst ravages in flocks of low vigor. The remarkable stimulating effect of sour milk on the growth and vitality of the fowls, which Rettger observed with his ordinary sour milk was not found, in our experiments, to apply to milk soured by *B. Bulgaricus*. It may be that the heating of the milk which precedes the inoculation with *B. Bulgaricus* is responsible for this. Besides producing certain chemical changes in the milk, perhaps making the proteins less digestible, heating kills all the various vegetative forms of bacteria in the milk and might thus be in some way responsible for the fact that our yoghurt-fed chicken did not show the remarkable superiority in weight, size and vigor that Rettger produced by feeding ordinary sour milk. Or perhaps pure cultures of the Bulgarian bacillus do not eliminate *B. Pullorum* as rapidly as does ordinary sour milk. Northrup has shown in her work "Upon the Influence of the Products of the Lactic Organisms upon *B. Typhosus*," that the minimum acidity produced by *Bact. lactis acidii* which will destroy *B. typhosus* is 37° in lactose broth, corresponding to 80° acid in milk and 25° acid in whey. The minimum inhibitive acidity produced by *B. Bulgaricus* is 53° acid in lactose broth, corresponding to 208° acid in milk and 66° acid in whey. She concludes further: "If certain species of micro-organisms are present in milk, they may, either by growing in association with the lactic bacteria or by some of their own metabolic products, cause a more rapid destruction of the typhoid organisms than the lactic acid bacteria are capable of causing alone." Marshall and Farrand have shown that there is marked associative action between certain other organisms and the lactic bacteria in milk. Or, as

shown by the work of Klotz, that small doses of lactic acid per os influenced metabolism favorably, while larger doses prevent this tonic effect. At any rate, a comparison of our results with those given by Rettger in Storrs's Bulletin 74 do not show any superiority of milk cultures of *B. Bulgaricus* over ordinary sour milk, especially when we take into account the ease with which ordinary sour milk is produced.

The experiments described above are, of course, far from exhaustive. They are only tentative and were merely undertaken for orientation, at a time when we did not know anything of Rettger's work on the use of sour milk in white diarrhea. Unfortunately the experiments could not be enlarged and continued on account of one of the author's leaving the Experiment Station and on account of lack of funds. Even as they are, the experiments conclusively show the effectiveness of milk cultures of *B. Bulgaricus* in bacillary white diarrhea. They are published, therefore, as a corroboration of Rettger's more exhaustive studies on this subject and with the view of attracting attention to this cheap and promising way of combatting the worst scourge of the poultry yard.

LITERATURE CITED.

- Belowonsky—*Annales de l' Institut Pasteur*, 1907, XXI, p. 991.
 Bertrand & Weissweiler—*Annales de l' Institut Pasteur*, 1906, XX, pp. 977-990.
 Cohendy—*Compte rend. de la Soc. d. Biologie*, 1906, Bd. 60.
 Duclaux—Cited by Wilke, *Med. Centralzeitung*, 1907, No. 42 and 43.
 Einhorn—Wood & Zublin, *Archiv für Verdauungskrankh.*, 1910, Bd. XVI, H 3.
 Gage—Notes on Ovarian Infection with *B. Pullorum* (Rettger) in the Domestic Fowl, Jr. *Med. Research XXIV*, No. 3, N. S. Vol XIX, No. 3, June, 1911.
 Herter & Kendall—*Journal of Biological Chemistry*, 1908, Vol. V, No. 2 and 3.
 Jones—Annual Report of the N. Y. State Vet. College, Ithaca, N. Y., for 1910, pp. 111-120; for 1910-11, pp. 69-88.
 Jones—The Value of the Macroscopic Agglut. Test in Detecting Fowls that are Harboring *B. Pullorum*, 1913, XXVII, No. 4, New Ser. XXII.
 Katschi—Cited by Wilke, *Mediz. Centralzeitung*, 1907, No. 42 and 43.
 Klatz—*Jehebuch für Kinderheilkunde*, B. 70, H. I.
 Marshall & Farrand—Bacterial Association in the Souring of Milk. *Spec. Bul. No. 42*, 1908, Mich. Agr. Exp. Sta.
 Northrup—The influence of the Products of Lactic Organisms upon *Bacillus typhosus* Technical Bulletin No. 9, Mich. Agr. Exp. Sta., 1913.
 Rettger & Stoneburn—Bacillary White Diarrhea of Young Chicks, B. 60, Storrs Agr. Exp. Sta.; Bull. 68, Storrs Agr. Exp. Sta.; Bull. 74, Storrs Agr. Exp. Sta.
 Wejnert—*Wiener Med. Wochenschrift*, 1908, No. 14.

FIRING.*

BY GEORGE B. MCKILLIP, PROFESSOR OF SURGERY, MCKILLIP VETERINARY COLLEGE, CHICAGO, ILL.

The term firing, in its present-day usage, refers to the application to the tissue of heated metal (the actual cautery), to produce a counter irritation for the treatment of pathological conditions, chiefly lamenesses, in the locomotory organs. It is a strict veterinary term. Not infrequently it is incorrectly used synonymously with cauterization, a more general term, the meaning of which includes the charring of tissues for a wide variety of purposes, using either heated metals or caustic drugs to accomplish the results. Firing, therefore, is but one type of cauterization and accomplished by the application of a heated metallic instrument to the tissues to be treated and for the purpose of relieving pathological conditions in the locomotory organs. It is a specific rather than a generic term.

Firing produces, in the tissue fired, an acute inflammatory process, the severity of which varies with the degree of cauterization. A study of the pathology of acute inflammations shows that the character of an inflammatory reaction, based upon the exudation, varies with the causative irritant. Thus one type of an irritant will create a purulent exudate; another irritant, a fibrinous exudate; another, a serous, and so on down the list. Cauterization (burning) is a type of irritant that produces a pure, serous inflammatory process. The exudate in a burned area is abundant; it is a serum of relatively low specific gravity and great fluidity; it contains all the ferment constituents of the body fluids, but has no fibrin or cellular content and is not coagulable under body conditions. It is because of these peculiari-

* Presented to the Fiftieth Anniversary Meeting of the American Veterinary Medical Association at New York, September, 1913.

ties that firing becomes so serviceable in the treatment of chronic inflammation causing lameness. How, we shall see later.

There is another feature about the acute inflammation of a burn that is of interest and importance in this connection. It is this, that in such a reaction there is a maximum of exudation with a minimum of tissue degeneration. The pathological process in an acute inflammation may be separated into three parts, viz., the hypermia, the exudation and the tissue degeneration. Every acute inflammation has three factors, but in the different inflammations they vary in their relation to each other. They vary not only in character, but also in amount and extent. Thus one irritant may cause an inflammation in which there is a considerable degeneration of tissue, but with slight exudation, and in another inflammation the reverse may be true. In firing as stated before, there is a reaction in which there is an abundant serous exudate and a minimum amount of tissue injury, providing that the burn is of the correct degree and providing also that the actually burned tissue is not considered.

The vesicant drugs and chemicals are irritants producing reactions like that from firing, there being a voluminous serous exudate out of all proportion to the amount of tissue injury from the toxicity of the irritant. These materials have practically the same range of adaptability as firing, but are less effective in that the reaction caused by them cannot be made sufficiently severe and extensive without endangering the superficial structures to which they are applied.

With these facts before us we are in position to consider the question of how firing affects lameness. Lameness in which firing is adaptable as a treatment may be divided into three groups: First, a large group of lamenesses due to simple chronic inflammations of the essential or accessory organs of locomotion in which the inflammations are in the late acute or early chronic stages and in which the effect of the firing is to cause a removal of the inflammatory deposits and a cessation of the original inflammation; second, smaller group, osseus and arthritic in character, in which there is an advanced simple chronic inflammation

with deposits and in which the effect of the firing is a continuation and exacerbation of the inflammation already present until the involved articular surfaces are obliterated; and third, a small group of muscle and nerve atrophies and degenerations in which improvement of local nutritional conditions by vascular stimulation in the area might be of importance in the regeneration of the organ at fault.

In the first group are included all simple inflammations of locomotory structures, in which the inflammation has progressed beyond the acute stage, and in which the ordinary treatments for acute inflammatory processes have failed to produce a resolution. In such cases there is deposited in the tissues inflammatory exudates of a solid character. These are chiefly fibrinous, and their presence, by irritation, produces a physiological aberration, which to the clinician is exhibited as a lameness. Acute inflammations that are not septic and that clear up promptly within ten days to two weeks with or without treatment leave no such deposits. The exudate in such a case is completely removed by liquefaction and solution in the body fluids. The course of the inflammation being short, there is not tissue hyperplasia, and there is a perfect return to normal.

A delayed resolution (beyond the fourteenth day) of an acute inflammation means that these exudates are not removed. They, by their presence, act as local tissue irritants and as etiological factors in the continuation of the inflammation as well as producing functional derangements and lameness. These deposits are within the tissues or upon the surfaces of the synovial membranes. They persist and are augmented by new deposits as the process goes on.

As this stage of delayed resolution of the acute inflammation continues, a tissue change, characterized as a chronic inflammatory process, begins. This consists essentially of the development of scar tissue in the inflamed area. The acute inflammatory exudates are gradually removed by liquefaction by the lytic substances of the body fluids, and the spaces they occupied are filled with this scar tissue. The older the inflammation the more scar tissue there is present and the less exudate in proportion.

Firing has for its chief aim in the treatment of these cases the removal of these solid exudates. It does this by bringing into the inflamed zone a great volume of normal body fluid, which contains the necessary lytic materials for liquefaction of the deposits. The free mobility of the exudate from the firing and its freedom from solids permits it to execute these functions and transport the products away without permanently embarrassing the tissue with its own presence.

Firing has no direct effect upon the scar tissue of the area. It cannot remove nor reduce in amount this pathological element of the lameness. However, by clearing the inflammatory exudates out of the tissues, thus removing the chief source of local irritation, the hyperemia and exudation ceases, and there is a healing. The condition is then known as a healed chronic inflammation. There is no further deposit of exudates, and the production of scar tissue is stopped, but that which is present remains; and, as is characteristic of scar tissue, it contracts as it ages, and to a greater or less extent erases the histological defects and correspondingly the physiological derangement. Thus it is seen, first, that firing in this group of cases has no place as a treatment in the acute stage; second, that its greater sphere of usefulness is in the stage of delayed resolution of the acute inflammation and in the earlier part of the chronic stage; and third, that the benefits derived by the firing of the more advanced chronic cases will vary inversely with the age of the inflammation.

The efficacy of firing on a given case of this kind depends upon certain features of its application. In the first place, the degree of cauterization must be sufficient to produce a maximum of reaction, but without devitalization of the immediately exposed tissues. Secondly, after the acme of the reaction is reached, which is in from four to six days, the care of the fired part must be such that there is a steady and continuous recession of the acute inflammatory phenomena until complete resolution has occurred. It is by this flooding of the area with an abundance of enzyme carrying body fluid and its prompt and complete removal that we hope to get results in this group of cases.

The second group of cases yielding to firing as a treatment includes the long standing pan arthritic inflammations in which the only hope of improvement is in an ankylosis of the involved bones. The purpose of the firing in these cases is diametrically opposite to that in the first group mentioned. Here it is for the purpose of continuing and augmenting the existing inflammation and of encouraging the further hyperplasia of tissue, so that the articulation may be obliterated. The early stages of these inflammations respond to firing as outlined under the first group. Thus a coronary periarthrititis, an intermetacarpal ligamentitis or a tarsal arthritis, if detected early and fired, will clean up perfectly and leave no anatomical defects. If allowed to go unchecked the ringbone, splint or spavin will get beyond such possibilities of treatment, and another course must be pursued.

While the technique of application of the treatment is much the same as in the former group, the aim is different. There is not the same necessity of a maximum of reaction, and the longer the inflammation persists the better the results. Point firing is used in these cases as opposed to line firing in the first group, the purposes being better subserved by these methods of application of the cautery.

The third group of cases in which firing may be used is in the non-inflammatory muscle and nerve atrophies and degenerations. We do not recommend firing as being very efficacious in these conditions, but occasionally line firing over the faulty organ, by stimulation of nutritional functions, may be an aid in the treatment.

Patients are fired in the standing position unless they are exceedingly rebellious, in which case they are cast and tied. A hood, a twitch and a side-line are usually sufficient. The area to be fired is clipped and lightly brushed. It should not be shaved, washed, nor severely brushed. It is essential that a covering of hair and epidermis be present, so that the cauterization may be confined to the line or point of contact of the iron and that the interspaces will be partially protected from the heat of radiation. A 10 per cent. cocaine solution is used for anæsthesia. From

three to five minims are injected into the subcutaneous tissue at points two inches apart over the entire field to be fired. After a delay of 10 to 15 minutes to obtain full effect from the cocaine, the patient is restrained and the application of the cautery begun.

For the first and third group of cases as described above the line or feather firing is done. This consists of burning the skin in lines, using for the purpose a suitable copper or iron instrument, which is heated to a degree sufficient to readily char the tissues, but not incinerate them. The lines of firing will leave the least blemish when they are made at right angles to the direction of the lay of the hair or at only a small angle to this line. In firing certain parts, notably the coronet, it is necessary, for best results, to run the lines parallel with the hair direction, although the resulting scar is increased thereby. If the edge of the firing iron be directed slightly upward, so that the depth of the burned incision is parallel with the direction of the hair follicles, the resulting scar will be lessened. The cauterization should extend to the deepest part of the dermis, but should not open into the subcutaneous spaces. Over bony and other prominences it is necessary to use care in this connection, and especially so if the iron be superheated. The lines should be spaced evenly about $\frac{5}{8}$ inch apart. For sake of appearance the lines should be parallel and straight. In certain locations diverging lines are permissible. Checked or crossed line firing may also be used in certain areas where the skin will stand a high degree of cauterization.

In firing for a given condition the fired area should extend considerably beyond the border of the diseased area, in order that the reaction shall be sufficient. Suitable designs to cover the surface of the part with lines of correct relation should be formulated. As a maximum reaction is wanted in these cases the cauterization must be as severe as the skin of the part will permit. By a variation in the depth of the lines and a variation in the exposure of the interspace to radiated heat one is able to vary the degree of irritation. Flexor surfaces of joints must not be fired as severely as extensor surfaces; thin skin with a light

coat of hair will not stand as much irritation as a thick skin with a heavier coat of hair. No rules can be laid down for these points in the application of the cautery; judgment and experience is necessary in getting the correct degree of irritation, a degree that will get results without the danger of devitalizing the burned skin.

In the cases of the second group the point firing is used. It is the aim here to allow the point of the cautery to penetrate through the skin and subcutaneum into the periarticular exostoses. It is intended that the firing shall augment the process already present, and most attention is directed to the immediate area of the disease. The fired area is less extensive, relatively, than that in line firing, and the irritation is made especially severe and deep over the diseased tissues, but not at other points. The fired points, for appearance, must be in checked rows, and for best results must be about $\frac{3}{4}$ inch apart. For the third group of cases line firing is used.

When the firing is completed the area is covered with a vaseline or lard ointment containing a vesicant drug. Usually cantharides is used and in a mixture of 1 to 14 of the menstrum. The patient is then tied in a suitable stall, so that it cannot lie down, nor reach the fired area with its muzzle. It is left so for 48 hours, at the expiration of which time the fired part is washed with warm water and soap to remove the blister ointment and such collections as may have accrued. The area is then allowed to dry and is covered with vaseline or lard or other bland oil. The patient is then turned into a box stall and made more comfortable. Every second day the washing and oiling of the fired part is repeated until the crusts, formed as results of the irritation, are loosened and removed. This takes from twelve to fourteen days. The application of oils is then discontinued and instead the part is subjected to a cold shower two to four times daily. The granulating lines often need applications of mild astringents at this time. As a matter of fact astringent washes may be used as a routine from the time the crusts are removed until the fired lines have completely healed.

The above method has proven to be efficacious as a post firing treatment. It insures a good healing of the cauterized skin and minimizes blemishes, and it assists in the regression of the inflammatory phenomena.

It is a rule with us that at the time the crusts are removed, that is on about the 12th to 14th day, gentle exercise of the patient is begun. This hastens the removal of the edema and promotes recovery from the effects of the firing. This is judiciously increased from day to day, but is never made at all severe.

By the middle of the third or the beginning of the fourth week after firing the acute phenomena attending the process have disappeared. The edema is gone, the lines of firing have healed and the new hair is well started. It is then time to turn the patient out pasturage. I wish to emphasize the importance of this part of the post-operative treatment. It is during this run at pasture that those processes occur, which insure against a continuation or recurrence of the inflammation. The terminal portion of the inflammatory exudates are now removed from the tissues, the scar tissue present becomes well organized and shrinks, and there is a general restoring of the structures to a normal condition. These processes are most active in the fourth and fifth week after firing, but they are not completed until three to six months have elapsed. We have had cases in which the fired structures have improved continuously in appearance, in tone and in function for twelve months after the application of the cautery. Patients do not do nearly so well at this stage if confined in a stable, even though only for part time, and they do very poorly if put to work. The run at pasture should be for not less than two months, and the longer the time the better. The season of the year makes no difference in this rule.

There are but few really important contraindications to firing. In some cases the blemish that follows firing precludes its use in the treatment of lameness in the high-class horses, especially when such disfigurement is distasteful to the owner. We do not under any circumstances fire a neurotomed part. Such a procedure is very apt to result in disastrous trophic disturbances in

the limb. Patients suffering from any acute febrile trouble must not be fired because of the increased danger of skin necrosis under such conditions. It is not an uncommon thing to have patients brought into the hospital to be fired when they are in the incubationary period of an acute, infectious disease and have them develop the disease at the time of the height of the firing reaction. We find this combination an unfortunate one, as each condition is made more severe by the presence of the other.

The subject of complications of firing is a more extensive and important one. Necrosis of the skin of the interspaces is a very common complication. It is always a danger because the operator is anxious in every case to get as high a degree of cauterization as the skin will stand. Skin necrosis is due to the devitalizing action of the heat. Using too hot an instrument, moving the heated iron over the surface too slowly or repeating the cauterization too often usually explains skin necrosis. Considerable experience is necessary to successfully guard against this complication.

The opening of important joint cavities and tendon sheaths is another complication resulting from inexcusable errors on the part of the operator. This is most frequently done with the point iron, but occasionally the careless use of the too hot feather iron will open a bursal cavity. The only areas in which it is permissible to allow the iron to penetrate deeper than the skin are the areas overlying bony, new growths. It is perfectly safe to allow the hot point iron to penetrate into a splint, a spavin, a ringbone or other similar exostoses. Under no conditions, however, must bones, ligaments, tendons or other normal structures be penetrated.

The puncturing of arterial trunks with severe hemorrhage is sometimes a complicating condition. It will not often occur to the careful operator.

Accidents of restraint, injuries to the fired area during progress of the inflammation and infection of the granulating surfaces are some of the less frequent associated conditions. Tetanus and even septicaemia have been recorded as complications.

Mild or even severe laminitis may make its appearance during the course of a firing reaction, especially if more than one limb is fired.

The chief sequel of firing is the blemish left by the healing of the cauterized points or lines. If executed properly, firing leaves but a slight blemish, but if there has been some irregularity in the technique or some complication, the scars may be large and most unsightly. Skin thickenings, contracted and distorted tendons and ligaments and hairless scars are some of the disfigurements that mark the cases of the careless operator.

A PROGRESSIVE PROFESSION.—Fifty years ago the profession of veterinarian commanded but scant respect in America. The eminent Dr. Alexandre Liautard was then in New York striving to convince the people of the importance of the profession, and scattered here and there was a scientist practicing the profession. For the most part, however, the present great science of veterinary medicine was represented in the United States by "hoss doctors," who held out around livery stables in the towns and villages, told risque stories, would bear watching in horse trades and had a specific for every ill that horse flesh was heir to—which usually killed the animal. At the convention held in New York recently some 1,200 members were in attendance, in which were included many scientists whose achievements have won for them world-wide fame. In many diseases that are common to both animals and humans the scientific veterinarian has by his achievements placed humanity under obligations to his profession.

The above complimentary comment upon our profession clipped from *The Country Review*, published in Baton Rouge, La., appeared while our friend Dr. Dalrymple was in New York, and was spontaneous in the heart of the editor of that paper.—[Ed.]

THE COST OF MILK PRODUCTION.—Bulletin No. 145, giving information relative to the cost of milk production has just been issued by the Massachusetts Experiment Station. It gives the cost of the food consumed by each cow in the station herd from 1896 through 1911, the estimated cost of caring for the cow and the cost to the farmer of a quart of milk. Data are also cited from other sources bearing on the cost of production. Five suggestions are made to dairymen and the place of dairying in the agriculture of the State is briefly discussed.

The bulletin may be secured by addressing the Director, Massachusetts Agricultural Experiment Station, Amherst, Mass.

REPORT OF THE SPECIAL COMMITTEE FOR THE DETECTION OF GLANDERS.*

BY E. B. ACKERMAN, ADOLPH EICHHORN, CHARLES E. COTTON, C. D.
MCGILVRAY, JOHN REICHEL AND CHARLES KEANE.

At the 49th annual meeting of the American Veterinary Medical Association by a "motion duly seconded and passed it was voted to recommend to the association that the incoming president appoint a committee to investigate modern diagnostic methods for the detection of glanders and reach an understanding as to the best method for the reduction of glanders."

After a meeting of three of the members of the committee, February 15, 1913, it was decided to adopt the following outline, in the manner in which the study of the disease glanders may be fully covered:

Glanders:

1. Cause, Variation in Virulence.
2. Animals Susceptible.
3. Period of Incubation.
4. Modes of Infection.
5. Manifestations, Symptoms, Prognosis.
6. Diagnosis: Mallein-Subcutaneous, Ophthalmic, Cutaneous, Laboratory, Cultural, Animal Inoculation Test, Blood Test, Opsonin, Conglutination, Precipitation, Agglutination, Complement Fixation.
7. Differential Diagnosis—Clinical, Laboratory.
8. Pathological Anatomy.
9. Quarantine—Clinical, Occult and Exposed Cases.
10. Disposition—Clinical, Occult and Exposed Cases.
11. Treatment.

* Presented to the Fiftieth Anniversary Meeting of the American Veterinary Medical Association at New York, September, 1913.

12. Disinfection.
13. Retesting and Subsequent Control.
14. Regulations, State and Federal.

The committee understood that its duties were to be confined to the study of the modern diagnostic methods and reach an understanding as to the best method for the reduction of glanders.

Prior to the discovery of the bacillus mallei as the specific cause of glanders by Loeffler and Schutz, in 1882, the diagnosis rested entirely upon clinical observations. The symptoms of the disease are perhaps better differentiated at this time, but in the main the general picture of the clinical case is unchanged.

Since then more tests and methods of more or less diagnostic value have revealed themselves than in any other infectious disease of animals, which may be tabulated as follows:

1. *Clinical Diagnosis.*
2. Mallein Tests. A—Subcutaneous Mallein Test; B—Ophthalmic Mallein Test; C—Cutaneous Mallein Test: 1. Cutaneous, 2. Dermal, 3. Endermal.
3. Laboratory Diagnostic Methods. A—*Examination of Pus or Nasal Discharge*: 1. Microscopic, 2. Cultural, 3. Animal Inoculation Test; B—*Examination of Blood*: 1. Opsonin, Conglutination or Precipitation Test, 2. Agglutination Test, 3. Complement Fixation Test.

1. *Clinical Diagnosis.* Without going into details the cardinal manifestations may be enumerated as follows: Characteristic nasal discharge; nodule or ulceration; enlargement of submaxillary glands; cording of the lymphatics and fluctuation in temperature range.

2. *Mallein Tests.* Mallein, the toxic substance produced in cultures of the bacillus mallei, was discovered by Hellman and Kalning in 1891. Pearson, working independently, prepared mallein and further proved that mallein, like tuberculin, produces a temperature rise in sensitized, infected animals.

In that the preparation of mallein varies greatly and the final product differs considerably, it is suggested that the name mal-

lein, like tuberculin, abortin and kindred preparations, be reserved to the final product obtained in the following way: One or more highly virulent strains that will produce an orchitis in a guinea pig in 24 hours following intraperitoneal injection and death in 14 days following subcutaneous injection, transferred to + 1.5 glycerin peptone bouillon and incubated no less than 6 weeks at 37° C.

The purity of the cultures and virulence of the strains should be proved before sterilizing the glycerin peptone bouillon cultures. After filtering out the killed bacilli and determining the exact volume of the filtrate, the filtrate concentrated to one-tenth its original volume over a water bath represents *concentrated mallein* or *mallein*.

Mallein solution as used in the subcutaneous test is mallein diluted with 0.5 per cent. carbolyzed salt solution.

Precipitated or purified mallein is the dry powder obtained from mallein, precipitated with many volumes of absolute alcohol. After filtering out the precipitate, redissolving in normal salt solution and washing repeatedly with alcohol (absolute) the precipitate is finally dried over calcium chloride or sulphuric acid. A 5 per cent. solution is generally used.

The mallein prepared of any one or more strains of bacillus mallei should be tried out on sensitized animals before it is relied upon in actual tests.

Even though the exact composition of the active principle of mallein remains unknown, the specificity of the reaction in sensitized animals is established beyond question.

Subcutaneous Mallein Test. This is the oldest of the mallein tests, is reliable when properly carried out and interpreted. It consists of the injection of mallein solution, which in sensitized animals will produce characteristic temperature rise, local and general reaction.

A characteristic temperature rise begins in from 4 to 8 hours, and the maximum temperature is reached in from 10 to 20 hours, with a gradual return to normal.

At least two temperatures should be taken before the injec-

tion of mallein solution 3 hours apart and five temperatures after the injection beginning not later than the tenth hour and continuing to the twentieth hour at intervals of not less than 2 hours.

The least difference between the before and after temperature should be 2.5° F., with the temperature rising to 103° F. or above.

Local Reaction. Several hours after injection a hot, painful, oedematous swelling develops, which may persist for several days, enlarging considerably and gradually disappearing.

Normal horses may show a local swelling which will not enlarge and rapidly disappears.

General Reaction. Lessened appetite, dullness, staring coat, muscle tremors, respiratory difficulties, altered pulse rate, all of which may or may not be present.

Ophthalmic Mallein Reaction. This test has the advantage in that it is simple and easy to apply.

Application of Test. A—Before applying the test, examine the eye for conjunctivitis or purulent change. Should a conjunctivitis exist, the eye test should not be tried.

B—Take temperatures before the ophthalmic test. Fever need not hinder the test.

C—Place 4 to 5 drops (0.1 to 0.2 for one test) of undiluted mallein or 5 per cent. solution of precipitated mallein within the lower eyelid with a dropper, glass rod, or camel's-hair brush. The other eye is left untouched to serve as control. Same brush or glass rod may be used from animal to animal.

D—As soon as the mallein is applied, a flow of tears nearly always appears with reddening of the conjunctiva and photophobia. These phenomena have no significance and disappear in several hours.

E—The characteristic manifestations of a positive reaction begin 5 to 6 hours and last 36 to 48 hours, sometimes longer. *A purulent secretion or discharge with reddening of the conjunctiva alone is significant of a positive reaction.* Swelling and gluing of eyelids may be seen in severe reactions.

F—The eye should be examined and compared in good light

16 to 18 hours after the application of the test. The conjunctiva and the eyeball should also be included in the examination after noting the discharge.

Generally the positive reaction is not accompanied by temperature rise or general reaction. The temperature variation does not occur in negative tests or normal animals. In positive reactions the rise may be observed in taking the temperature twice, the first time when the test is applied, and the second when the readings are made 16 to 18 hours later.

G—The results of the test to be interpreted and recorded as follows:

- 1—Negative, N, Eye unchanged.
- 2—Suspicious, S. Sero-Mucous Discharge.
- 3—Positive, P + Sero-Mucous Discharge with purulent flakes.
- 4—Positive, P ++ Distinct purulent discharge.
- 5—Positive, P +++ A purulent discharge with swelling of the lower eyelid.
- 6—Positive, P ++++ Strong purulent discharge with gluing together of both lids.

H—If the result of the test is negative or questionable 24 hours after the first application the test may be repeated at once on same eye or the control eye. If repetition is also negative or questionable the test may be repeated in three weeks.

I—The intensity of the ophthalmic reaction bears no relation to the stage or development of the infection.

Cutaneous Mallein Test. In the cutaneous dermo-endermal mallein tests the concentrated mallein is applied with a knife or vaccination needle; rubbed into a shaved area or injected into the skin. In the latter test a highly diluted mallein is used in preference to a concentrated mallein.

In positive case a spreading, warm, painful and oedematous swelling will be observed in 24 hours.

The reactions are positive when the distinct visible swellings in contrast to the unaffected control areas develop. In severe reactions vesicular eruptions may appear.

In that the skin tests are complicated, requiring special instruments, skill and practice, they are not considered practical.

Laboratory Diagnostic Methods. The demonstration of the organism in smears in the microscopic examination and the isolation of the organism culturally—or the demonstration of the infection in the injection of the suspected material into a male guinea pig resulting in a typical Strauss reaction is positive evidence of the disease, but the absence of these findings or negative animal inoculation tests does not warrant a negative diagnosis.

Examination of Serum. 1—Opsonin, conglutination or precipitation tests. The first have proved laborious and impracticable, and the latter unreliable.

2—Agglutination test.

Depends upon the power of undiluted immune serum to clump bacteria suspended in carbolized salt solution. The presence of agglutinins is determined quantitatively in using measured amounts of serum and test fluid.

Readings to be made after incubating the tubes for $\frac{1}{2}$ hour at 37° C. centrifugalizing at 1,600 revolutions for 10 minutes and allowing tubes to stand at room temperature for 2 hours.

The same result may be obtained in allowing the tubes to incubate at 37° C. for 24 hours and to stand at room temperature for 12 hours more.

The appearance of a veil-like membrane with turned-in edges or small clumps or flakes of grayish white or brownish at the bottom of the tube may be regarded as positive agglutination.

Sharply circumscribed sediment in the center of the tube with shape of lentil seeds indicated the absence of agglutination in centrifugalized tubes.

The agglutination value of over 1—1000— is indicative of glanders, but since high agglutination titres were obtained only in the acute form of the disease, it is advisable to combine this test with the complement fixation test and not make the diagnosis on this test alone.

Complement Fixation Test. This is the most complicated of

the tests and must be considered purely a laboratory diagnostic method requiring careful technique. Like the agglutination test, it is a quantitative reaction in which the affinity of the immune bodies in the serum of an affected animal to the glanders antigen is utilized for the phenomena of the reaction in which the following play a part: Complement = normal guinea pig serum; sheep rabbit amboceptor = sensitized rabbit serum with washed red blood corpuscles of sheep; glanders antigen = shake extract of killed glanders bacilli; sheep corpuscles and the clear serum of the suspected animal.

The results of the test should be interpreted as follows:

1—Horses in which the serum produces a complete fixation of the complement in the quantities 0.1 c.c. and 0.2 c.c. should be considered as glandered.

2—Horses in which the serum gives a complete fixation in the quantity of 0.2 c.c. and an incomplete fixation in the quantity of 0.1 c.c. should likewise be considered as glandered.

3—Horses in which the serum produces an incomplete fixation of the complement in the quantities of 0.1 c.c. and 0.2 c.c. should also be considered glandered.

4—Horses in which the serum shows no fixation of the complement in either tube should be considered free of glanders.

The value of any diagnostic method cannot be accurately estimated or judged, unless autopsies are made by a carefully trained veterinarian of all animals tested that die or are destroyed. Macroscopic examinations are not sufficient with the presence of atypical lesions.

Unless typical lesions are present, histological and bacteriological examinations must be resorted to.

In deciding upon a method which would be most satisfactory for the diagnosis of glanders, the simplicity, reliability and trustworthiness of the method must be above reproach.

The results should manifest themselves as soon as possible, the reaction should be well marked and distinct and easily applicable by the average practicing veterinarian.

A test with these requirements places a test into the hands

of the practicing veterinarian along with which the standing of the veterinarian in the community and the confidence of the public to the veterinarian is brought into closer relationship, in that it enables the veterinarian to personally decide on the results of the test.

The ophthalmic test not only meets all these requirements, but is without doubt the most convenient diagnostic method at our command.

Is reliability compares favorably with any of the other available tests.

The reaction is usually distinct, and doubtful or atypical reactions are rather infrequent.

The ophthalmic test does not interfere with subsequent serum or other mallein tests if such are deemed necessary.

The test may be repeated within 24 hours on same or control eye, and final retest in not less than three weeks.

The ophthalmic test should be recognized by state and federal authorities, since its reliability can no longer be doubted.

In all atypical and doubtful cases of the ophthalmic test the combined complement fixation and agglutination or subcutaneous mallein tests should be utilized for confirmation. Such a procedure should minimize the failures and assure the best results in the control of the disease in a single stable or in an entire community.

APPEARANCE OF THE REACTION OF THE VARIOUS TESTS AFTER INFECTION.

Agglutinins reach their appearance in from 4 to 5 days and continue to increase in the early stages of the disease and diminish as the disease becomes chronic.

Specific amboceptors of the complement fixation test may be demonstrated in from 7 to 10 days in quantities of diagnostic value, and their presence may be demonstrated during the entire course of the disease.

Subcutaneous mallein test may, as a rule, be relied upon 15 days after infection.

Ophthalmic mallein test may be relied upon 3 weeks after infection.

Effect of One Test on the Others. All blood serum tests are influenced in 3 to 6 days after a subcutaneous injection of mallein or any glanders antigen, including glanders vaccines, for a period varying from 6 to 8 weeks following injection of mallein and up to 3 months and even longer following injection of glanders antigen or vaccines. All blood samples therefore should be taken prior to or at the time of the mallein injections.

The subcutaneous mallein test or injection of glanders antigen and vaccines may influence the ophthalmic mallein test. The ophthalmic mallein test should therefore be withheld for 30 days after application of the subcutaneous mallein.

Control. In the reduction of glanders all clinical cases should be immediately destroyed. All suspected and exposed animals should be tested and the positive reactors destroyed. The remaining contact horses held under restrictions subject to further test after the expiration of at least 15 days. All infected premises should be thoroughly cleansed and disinfected.

All interstate movements of horses, mules and asses should be regulated to include proper testing for glanders by the state or federal governments.

Compensation for clinical and occult cases should be provided for.

As this committee was obliged to confine its efforts to only a part of the outline of the proper consideration of the disease glanders in its entirety, we respectfully recommend for your consideration the advisability of the appointment of a permanent committee or commission to consider the subject as outlined in the beginning of the report submitted herewith.

A MANY-SIDED VETERINARIAN.—Our esteemed collaborator, Dr. W. H. Dalrymple, of Baton Rouge, La., has appeared in many roles during our long and cherished acquaintance with him; but he seems not to have exhausted his *repertoire*, as we find him representing the Baton Rouge Chamber of Commerce at an Immigration Conference in New York on September 17th and 18th.

SANITARY POLICE MEASURES AND HOG CHOLERA.*

BY A. T. KINSLEY, M.Sc., D.V.S., PATHOLOGY, KANSAS CITY VETERINARY COLLEGE.

Statements in this paper refer primarily to the principal hog producing states; that is, to local conditions in particular, but they will also probably be applicable to the entire United States, and in a general way to Canada and all other foreign countries.

It is not the purpose in this paper to enter into the pathology of this disease, but to briefly discuss some of our laws controlling the movement and quarantining of cholera hogs.

Hog cholera probably first made its appearance in the United States in 1833, in the state of Ohio, and since that time it has become widespread throughout the entire hog raising section of this country. From reports it is evident that every state in the union has suffered losses from hog cholera.

The extent of the losses in 1912 from hog cholera, in Iowa, Nebraska, Kansas and Missouri, exceeded three million hogs, with an estimated value of over thirty million dollars. The total losses in the United States for 1912 approximated one hundred million dollars. So far as can be determined from available statistics the relative losses both in the number of hogs and their value has never exceeded or been equal to the losses of 1912, and these extensive losses have occurred regardless of the fact that large quantities of anti-hog-cholera serum had been used.

When pressed for a reason for the stupendous loss of hogs during the past year, it must be admitted that there has been some serious defect in our methods of control of this disease.

Hog cholera is now prevailing extensively in the four states above mentioned and is quite generally distributed in all the states of the Mississippi valley. It is probable that the losses

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

for 1913 will be far in excess of those for 1912, unless some radical changes are inaugurated and enforced in the methods of control of this disease.

Practically every state has some law or regulations providing for the control of hog cholera, and during the past year many states passed new and stringent laws, some of which should be efficient and if properly enforced will materially diminish the losses at once and ultimately will eliminate hog cholera from those states.

Nebraska has no quarantine regulations or restrictions for the movement of cholera hogs. Iowa has a regulation requiring the immunization of exhibition hogs, and a clause quarantining all hogs immunized by the simultaneous method for thirty days, and the premises where hogs have been simultaneously immunized for six months. Missouri provides for burying or burning of carcasses of hogs dead of cholera, and has recently made provision for a three weeks' quarantine and simultaneous immunization of feeders. Minnesota has a provision requiring burning or burying of hog cholera carcasses, a provision permitting quarantining of affected herds, and a provision requiring the disease to be reported to the Sanitary Commission. Indiana permits removal of hogs showing no symptoms, from infected pens, providing vehicle of transportation does not scatter litter, and that when hogs are unloaded, all litter from the carrying vehicle is burned, and further, provided that the hogs are slaughtered where there is B. A. I. inspection. Another clause prohibits the sale of hogs for four weeks after virus has been used. Feeders may be purchased, providing they be given the serum treatment within forty-eight hours after their arrival. A very important clause provides for the report of the prevalence of hog cholera, by all licensed veterinarians, failure to do so being sufficient cause for revocation of their license. Kentucky provides for burying or burning carcasses of hogs dead of cholera, and the immunization of exhibition hogs. Tennessee has a peculiar provision regulating the disposal of the carcasses of hogs dead of cholera, it provides that the carcasses be burned or sent

to a rendering tank. They have a general law requiring the notification of the health board of any and all communicable diseases of domestic animals. Georgia prohibits the sale for slaughtering, breeding or feeding of hogs affected with cholera, or hogs from infected pens.

Practically all of the foregoing states have general laws relative to infective diseases, but in nearly every state hog cholera has not been considered in the same relation as infective diseases of other animals. Presumably, every state and country, in accordance with general sanitary laws, prohibits the shipping of cholera-infected hogs to market, but it has been self-evident that hundreds and thousands of cholera hogs are transported to our markets every year, and thus far, without any noticeable remonstrance from the sanitary authorities. It is very evident that hog cholera will prevail as an epizootic as long as the producer is permitted to load and ship cholera hogs to market, for such procedure provides means of distributing infection throughout the country.

A few states have quarantine regulations relating to premises and hogs infected with cholera, but it is doubtful if any state actually quarantines cholera hogs. This is a serious mistake and must be overcome if this disease is ever controlled.

Previous to the use of anti-hog-cholera serum it was possible to control this disease so that the losses rarely exceeded 90 per cent., and in many instances 80 to 90 per cent. of the hogs in infected herds could be saved. The disease can be prevented from extending to the neighboring premises through a rigid enforcement of quarantine regulations.

A difficult problem in the control of any infective disease is obtaining the knowledge of the existence of the disease before it becomes widespread. In order that a disease be reported, each commonwealth should be divided into districts or units, and in most of the states a county could be designated as a unit. Each unit should have a county veterinarian whose duty should be the investigation of reported outbreaks. A further provision should require the producer to report any disease of his domestic

animals to the county veterinarian, who in turn should investigate and report to the proper state official. Every state should further provide for the reporting of all infectious diseases observed by graduate veterinarians to the respective health official, either county or state. If these regulations, which would probably vary somewhat in different states, were concisely prepared, duly published and rigidly enforced, the producers would show their appreciation by complying in every detail.

Just recently the writer visited a section of the country along the Iowa-Missouri border. No hog cholera had been reported in this particular section for several years, although it had occurred in some herds within ten miles of this community in 1912. One man had about two hundred hogs and lived on the Missouri side of the state line. His hogs began to die in March or April, and up to the 20th of July about one hundred and eighty had succumbed to the disease. This man did not inform any one that his hogs were affected until they were practically all dead, and when confronted with the seriousness of the lack of proper control, he contended that the disease was not hog cholera. The carcasses had been disposed of by covering them in gullies and ditches on his premises. Three neighbors whose farms are so situated that they receive drainage from the infected pens, now have hog cholera in their herds, and the losses will be extensive. If a rigid quarantine had been enforced early in the outbreak and the carcasses properly disposed of, the disease would probably have been confined to the one premise.

The proper disposal of carcasses of hogs dead of cholera is of very great importance in the control of this disease, because of the prevalence of carnivorous animals in all rural communities. Dogs, cats, fowls and various wild animals and birds consume freely of the carcasses of animals, and are no doubt a very important factor in the spread of communicable diseases. The fact that the virus maintains vitality in the surface soil and in the carcass for a considerable time should be sufficient evidence to warrant the proper disposal of carcasses of cholera hogs. In many communities in Missouri, Iowa, Nebraska and Kansas,

in 1912, one could see the carcasses of hogs strewn in ravines, by-ways and highways, and railroad right of ways, and even in the alleys and streets of the smaller towns. Such miscellaneous sowing of virus, no doubt, is in part responsible for the prevalence of hog cholera at the present time.

Another modern method of spreading hog cholera has been by the improper use of the virus in the simultaneous immunization of hogs against cholera. Even when the virus is used judiciously, in the simultaneous immunization an occasional hog dies of cholera. It is very evident that the virus would exist in the carcass of such a hog. It is also possible that the virus is eliminated before death from fatally diseased hogs, and if hog cholera is similar to many of the other infective diseases, the virus is eliminated from the simultaneously immunized hogs, even though they do not die of the disease. It is, therefore, an undisputed fact that many new centers of hog cholera have had their origin from the sowing of the disease by the use of virus immunization. The quarantining of all hogs for a period of four weeks, and quarantining the premises for six months where said hogs were immunized, as required by the regulations in Iowa, is the only safe procedure where the virus is permitted to be used.

In conclusion it is evident that the various states in the principal hog raising section of the United States have either insufficient laws for the efficient control of hog cholera or the sanitary authorities of said states are not enforcing the laws controlling hog cholera in a manner to obtain results that should be obtained. Further, it is the opinion of the writer that if laws and regulations were provided and enforced, first, prohibiting shipping of cholera hogs, second, providing strict quarantine of infected premises, and the proper disposal of the carcasses of hogs dead of cholera, and third, effectually controlling the distribution and use of virus; the losses from hog cholera could be reduced fully 50 per cent. without the use of any anti-hog-cholera serum and 90 per cent. by combining police control measures and the judicious use of serum.

THERAPEUTICS OF PARENCHYMATOUS MASTITIS.*

BY LOUIS A. KLEIN, UNIVERSITY OF PENNSYLVANIA.

The pathological alterations of parenchymatous mastitis show a striking similarity to those of pneumonia. There is an exudation of blood serum and an immigration of leucocytes and wandering connective tissue cells into the acini and ducts of the gland, which is accompanied by an exfoliation of the epithelial cells lining the acini and ducts. There is also an inflammatory exudate into the interstitial and subcutaneous connective tissue, which is sometimes very pronounced. If these exudates can be removed and the epithelium is capable of regeneration, resolution occurs. If the exudates are not removed and the circulation is not restored to normal within a certain period, the inflammatory process in the interstitial tissue assumes a productive character. An increase of the interstitial connective tissue occurs and the udder becomes indurated. Subsequently, the newly-formed connective tissue contracts and produces atrophy. The epithelial cells disappear in such cases, either as a result of the pressure from the contracting connective tissue or because of extensive destruction at the beginning of the disease. If the milk ducts or canals are obstructed by clumps of casein or fibrin, the pathological secretion will be dammed up and abscesses will form. If the circulation is cut off from a section of the inflamed area by thrombosis or by pressure from the inflammatory exudate or collections of pus, necrosis or gangrene will occur. The necrosed area is subsequently separated from the healthy tissue by suppuration and may then become encapsulated, or, as occurs more frequently, the line of demarcation may extend to the surface, when the sequestrum may be eliminated spontaneously or removed by operation.

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

Resolution and the avoidance of complications, it will be seen, depend upon the prompt removal of the exudates. The exudate in the acini, ducts and cistern can be drawn off by milking, but that in the interstitial tissues must be resorbed.

Resorption is a complex physiological process which cannot be generated by artificial means, but the natural processes concerned can be stimulated or increased in capacity by certain therapeutic methods. The principal factors concerned in resorption are the interchange of fluids between the blood and tissues, the leucocytes, and the quantity of blood flowing through the part. By utilizing these natural forces resorption can be promoted.

Purgatives and diuretics increase the interchange of fluids between the blood and tissues. By causing a reduction in the fluid of the blood they cause fluid to be absorbed from the tissues. This is known as the derivative or revulsive method. Sialagogues and diaphroetics also produce a derivative effect. The most striking illustration of the effectiveness of this method is the result obtained from the use subcutaneously of arecoline, a purgative and sialagogue, in the treatment of laminitis in horses. In parenchymatous mastitis, it is customary to use magnesium sulphate as a purgative but eserine and pilocarpine combined act more promptly and perhaps more thoroughly and effectively, since they are sialagogues as well as purgatives, although their cost may prohibit their use in some cases. Arecoline is not recommended for cattle. On account of their weakening effects, purgatives cannot be repeated, but the derivative action can be continued by the use of diuretics. Potassium nitrate is a very popular diuretic in the treatment of parenchymatous mastitis but one of the less irritant saline diuretics would be more desirable. Phytolacca, which has been used empirically in the treatment of mastitis for a long time, has a diuretic action and no doubt exerts its effects in this way. Diaphoretics are of no practical value as derivatives in cattle practice.

Leucocytes assist in resorption by phagocytosis and by causing the disintegration and solution of solid exudates by means of a ferment. Leucocytosis may be increased by the local applica-

tion of stimulants, such as tincture of iodine, spirits of camphor, oil of turpentine, etc., and by other measures which increase the flow of blood to the part, as hot water bathing, vapor baths, Priessnitz dressing, poultices, plasters, frequent milking and massage. According to Hess, massage should only be used after the inflammation has begun to subside and pain has disappeared. If it is applied at the height of the inflammatory process the disease will be extended to the adjoining quarter on the same side or on the opposite side and the secondary infection is usually more severe and more difficult to heal than the original process. Massage is also contraindicated when suppuration or necrosis is present. The phagocytic function of the leucocytes can be stimulated by the injection of bacterins, but this action is a specific one and the bacterin is only effective for the particular species of organisms used in its preparation. Since parenchymatous mastitis is a polybacterial disease the preparation or selection of a suitable bacteria for each case would involve considerable detail work. Schmidt, of Kolding, Denmark, the discoverer of the successful modern treatment for milk fever, recommends as a substitute for bacterins the infusion into the udder of equal parts of absolute alcohol and glycerine. This mixture, he says, will kill and dissolve numbers of the bacteria concerned in the disease and when these dissolved substances are absorbed specific opsonins will be produced which will stimulate the phagocytic action of the leucocytes against the bacteria remaining in the udder. But the mixture has a destructive action upon the epithelium of the udder and for this reason can only be used in those severe cases where the life of the animal is threatened or where there is no prospect of the return of the milk secretion. In other cases, the mixture is diluted with an equal amount of physiological salt solution. Usually about 250 c. c. is infused into the infected quarter and the quarter is not milked out for three days. The disintegrating and solvent action of the leucocytes on solid exudates cannot be directly affected by drugs but a similar action can be obtained with potassium iodide, which destroys pathological cells and causes them to degenerate.

and by sodium chloride, sodium bicarbonate, sodium sulphate and ammonium chloride, which dissolve and liquify solid inflammatory products.

An increased flow of blood through the part may be brought about by heart stimulants, local stimulant applications, hot water bathing, vapor baths, Priessnitz dressing, plasters, poultices, massage and frequent milking. Caffeine will serve the purpose of both a heart stimulant and diuretic and may be given in the form of the alkaloid or strong coffee. Frequent milking, every one or two hours, is a very important method of treatment. The manipulation of the test dilates reflexly the blood vessels of the udder and causes a greatly increased amount of blood to flow through the udder. It also removes the exudate and prevents its decomposition and the formation of irritant bacterial products in the acini and ducts of the udder. A suspensory bandage promotes the circulation in the udder and also reduces pain by relieving tension upon the tissues.

When it was demonstrated in the last quarter of the nineteenth century that bacteria were the direct cause of mastitis, Franck advocated that the disease be treated by destroying the bacteria concerned by the injection of antiseptics into the udder. This method of treatment was adopted by many veterinarians, but the results were disappointing. It was found that the antiseptic solutions irritate the udder tissue and frequently increase the inflammation even when diluted to a point where their effectiveness seems doubtful. Subsequently it was observed that all of the beneficial effects resulting from the injection of antiseptic solutions could be obtained by frequent milking without the irritation produced by antiseptics.

Some antiseptics when administered by the mouth are eliminated through the udder. The writer administered hexamethylenamina better known under the name of urotropin, to a cow in one to two dram doses and demonstrated formaldehyde in the milk in twenty-four hours. Boric acid given in two to six dram doses at the same time to the same animal appeared in the milk in twelve hours. No irritant effects were produced. Iodine is

eliminated in the milk when potassium iodide is given and salicylic acid is also excreted through the udder. When doses of 45 grains to $1\frac{1}{2}$ drams of potassium iodide were given daily, Labourdette found that the milk contained up to $3\frac{3}{4}$ grains of potassium iodide to the quart. The amount of the other substances eliminated in the milk has not been determined.

The germicidal power of milk, which is feeble under normal conditions, is increased in mastitis. Its effect on the bacteria of mastitis has not been accurately tested but the writer has observed a few cases of streptococcic mastitis in which it appeared to have destroyed the organisms of the disease. Whatever advantage can be obtained from this property can be exerted to the fullest extent by frequent milking of the affected quarter.

While bacteria are usually the direct cause of mastitis there are certain accessory or predisposing causes which should receive consideration in treating the disease. These are damp, cold floors, sudden exposure to cold air, excessive cold, drafts, incomplete milking and stasis of milk. Deep milkers are more susceptible to the disease than others.

Usually the fever is reduced by the action of the purgative and the diuretics. Very high temperature indicates septic infection and camphor, alcohol and quinine are then indicated. Necrosis, abscess formation, indigestion, paresis of the rumen, muscular weakness, posterior paralysis and other complication are treated according to the usual methods.

REFERENCES.

- Kitt, Dr. Th.—Pathologische Anatomie der Haustiere. Vierte Auflage. I Band.
Fröhner, Dr. Eugen.—Allgemeine Therapie für Tierärzte. Dritte Auflage.
Hess, Dr. E.—Erkrankungen des Euters, Bayer-Fröhner Tierärztl. Chirurgie und Geburtshilfe. III Band. III Teil.
Schlampp, Dr. W.—Therapeutische Technik für Tierärzte. II Band.
Schmidt, Dr. J.—Die Tiefen wirkung der Desinfektionsmittel bei örtlichen bakteriellen Krankheiten, besonders bei Euterentzündung. Deutsche Tierärztliche Wochenschrift. Jahrg. 21, Nr. 24 (pp. 372-374).

MISS ALICE LILLY BRIDGE PALMER arrived at the home of Dr. and Mrs. C. B. Palmer, Easton, Pennsylvania, on October 19, 1913. The young lady seemed in excellent spirits and weighed $7\frac{3}{4}$ pounds at the time of her arrival.

ARTIFICIAL INSEMINATION AND ITS RELATION TO THE VETERINARIAN.*

BY DR. F. F. BROWN, KANSAS CITY, MO.

The merits of artificial insemination of animals has been given but very little attention by the veterinary profession as a whole. Until recently this method of impregnating animals has never been utilized in a general way, but has been restricted to a limited number of valuable females having some congenital defect or pathologic condition.

Perhaps one of the greatest reasons for lack of interest in this subject on the part of veterinarians is their lack of knowledge or appreciation of the practical adaptability of the method to daily breeding operations.

Doubtless the schools engaged in teaching veterinary science are in a great measure responsible for this lack of knowledge. The individuals composing the faculties are not ordinarily engaged in active practice in breeding districts, so that the importance of this method has not fully impressed them.

It is to be regretted that students and graduates go from the doors of our colleges uninformed on this important branch of veterinary science. I seriously question if there is a single standard school that gives the subject more than passing notice and perhaps then with the impression that it is only of experimental interest.

With the belief that our profession is not fully awake to the importance of this subject the writer has been prompted to the preparation of this paper.

Progress is being rapidly made in this work, not by veterina-

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association at New York, September, 1913.

rians, but by laymen, and it should not be for us to stand idly by and see ourselves outstripped by men untrained in a branch of work that is properly ours.

Laymen have developed the practice of artificial insemination to a point where it has been placed upon a practicable basis and may be generally utilized in daily breeding operations in the equine. By experience the stallioner has learned that the services of his animal may be extended manyfold by this method, and that the energies of the sire may be conserved and not overtaxed and that the number of progeny possible from a sire during his lifetime is almost incalculable.

Relying upon the physiologic fact that but a single spermatozoon is necessary for successful fecundation, and that hundreds of thousands are lost at each service, it suggests itself to the thinking man that numerous divisions may be made, so that several mares may be bred just as effectively as the usual single individual.

The technique must surely be simple if laymen with but little training can practice this method successfully. Observance of cleanliness with attention to proper temperature and avoidance of exposure to bright sunlight are some of the requisites for success.

Artificial insemination in the hands of careful, observing men is rapidly becoming an important commercial proposition. No man can predict its influence on the future production of animals.

A statement can only be made of what is already being accomplished with a hint as to its possibilities for the future.

These statements are based upon personal experience and extensive inquiries made to reputable breeders engaged in practicing artificial insemination from one to five years. I have in my possession upwards of 160 letters from breeders in answer to questions submitted to them, and from the various sources of information the following conclusions have been reached concerning the advantages of artificial insemination over natural service.

1st—Stallion owners are able to restrict the services of their

animals to one period a day, thus conserving the virility of the sire and contributing to more vigorous offspring.

2d—By effecting a division of the semen from 7 to 18 mares may be easily bred from a single service.

3d—That a higher percentage of foals results for the reason that insemination is certain and the stallioner soon learns to detect and reject mares showing evidence of confirmed sterility.

4th—That impregnation is far more certain in case of atresia of the cervix, a tortuous or elongated cervical canal, together with various pathologic conditions of the vaginal tract and numerous other conditions.

5th—The opportunity for conveying contagious or infectious genital diseases is greatly lessened and reduced to the minimum by the observing operator.

6th—That the opportunity for physical injuries to either stallion or mare is practically nil by this method.

7th—That the offspring are equal to and generally should be superior to the natural product on account of the sire not being overtaxed.

8th—That the results obtained justify the stallioner reducing the service fee if necessary, making it no excuse for any man to breed to a scrub and putting the latter out of existence through competition alone.

9th—That certain shy breeding mares may be bred successfully at the termination of the estral period and in the hands of several experienced men impregnations have been accomplished by breeding at any period without regard to estrum.

10th—That with proper care semen may be transported distances and impregnations successfully made.

11th—That cheap females may be utilized as in case of the burro which when crossed with a horse of proper type results in a hinney that finds a ready market at a remunerative figure.

Breeders report that by this method they are able to breed daily all the mares that are presented and several have reported breeding nearly 300 to one sire during the season, with the comment that they could have bred twice the number.

The man who interests himself in artificial insemination will naturally become a student of those conditions responsible for sterility, some of which he may be able to overcome, and others he will reject, thus giving rise to a higher percentage of foals. Instead of the usual 50 or 60 per cent., careful breeders are getting 80 to 90 per cent. and even better by this method. A breeder in charge of a large establishment reports that in 1912 he rejected 136 and in 1913 231 mares as unsuited for breeding on account of clinical evidence of confirmed sterility.

The yearly losses to mare owners that accrue from sterility are enormous.

Many of these cases are victims of genital diseases capable of being transmitted by coition. An examination of the discharges from the uterus of a certain class of sterile mares will reveal a peculiar organism that is capable in cultures of very promptly destroying the life of spermatozoa. The same statement will apply to the discharge itself. Infectious abortion is unquestionably disseminated through the act of coition, and this disease is assuming alarming proportions in some localities.

Every public breeding establishment is in a sense a menace to animal health through the spread of communicable diseases of a genital character, and the owners of these establishments bear a certain relationship and responsibility to the public. This is a vital question affecting the horse-breeding industry, and its proper solution is not easy. The time will perhaps be when these men will have to show proficiency in detecting communicable diseases if sanitary sentiment keeps the pace it is now traveling. In the meantime artificial insemination can be utilized to evade these disorders and is being done by the more progressive breeders.

With a better knowledge of the biology of spermatozoa we are learning to surround them with such environment as will properly sustain and prolong their life. The feat of transporting semen distances for the purpose of insemination has been successfully accomplished for a sufficient number of times to demonstrate its practicability as a breeding measure. Breeders have

repeatedly carried semen 25 and 30 miles to ranches and have successfully impregnated mares. A breeder at St. Joseph last season made a service and six hours later a mare was bred in Omaha resulting in impregnation. It is not beyond the range of reason or possibility for men trained and equipped to make numerous artificial services at points over a wide territory adjacent to their breeding establishment without ever taking the stallion off the premises.

When we consider that a three to five-dollar burro can be made to produce a forty to sixty-dollar hinney at weaning time by this method one can gain a slight insight into the possibilities of what can be attained by artificial insemination.

The brief references and hints made are not founded on dreams or air castles, but are gleaned from personal experience, and those of reputable breeders. The feeling obtains that this subject has been woefully neglected by our profession and that the breeders of to-day are working out these problems without veterinary aid because the veterinarians as a whole have given the subject very little consideration. Here is a great scientific field almost wholly neglected, needing the combined attention of pathologist, bacteriologist, and practitioner, whose united investigations would unquestionably reveal a multitude of truths that yet lie deeply buried in mystery.

ABOUT THE PHOTOGRAPHS TAKEN AT A. V. M. A. MEETING IN NEW YORK IN SEPTEMBER—The REVIEW office has been deluged with inquiries in regard to a group photograph taken on the roof of the Hotel Astor during the meeting of the A. V. M. A. in New York in September, for which they had paid \$1 and had not received the picture. We are in the same position, and so are the Fire Chiefs, who were in convention in New York at the same time. The photographer's name is Chas. F. Allen, address, 25 West 42d street, New York. Under date of October 8th, Mr. Allen wrote us as follows: "Delay in sending veterinary men's photos due to shortage of that particular size of paper—will be sent out Wednesday, October 15." Anyone not receiving their picture within a reasonable time should write Mr. Allen direct at above address.

TYMPANY OF THE RUMEN, OR BLOATING: WITH A PROMPT AND EFFICIENT REMEDY.*

BY DANIEL J. HEALY AND JOHN W. NUTTER, LEXINGTON, KY.

During the past spring there was an unusual growth of white clover in many of the pastures of Central Kentucky, and our attention was called to this subject by the occurrence of several cases of tympany in the station dairy herd.

As is well known, tympany, or bloating, may follow the ingestion of certain foods. Alfalfa and clover, especially the red and white varieties, while in fresh bloom, are particularly dangerous in this respect.

"Cadeac maintains that paresis of the rumen is the essential cause in all cases,"† but the following experimental work proves conclusively that when bloating follows the ingestion of certain foods, it is caused by rapid fermentation in the rumen.

J. W. Nutter, who has charge of the dairy herd, mixes sodium bicarbonate with the salt which is fed to the cows. This is a fairly satisfactory prophylactic measure, although from time to time a case of tympany will occur.

It occurred to one of us (Healy), that fresh clover blossoms may contain an appreciable quantity of sugar, which, undergoing a rapid fermentation in the rumen, would account for the acute distention by gas. To test this, a known quantity of fresh flowers, gathered from clover heads, was placed in 100 c.c. of distilled water and boiled for 20 minutes. The original weight was restored with distilled water, and the solution strained through a funnel, which retained the mass of flowers. The sugar content of the solution was then determined by the Fehling cop-

* From the Laboratory of the Kentucky Agricultural Experiment Station, Lexington, Kentucky. A preliminary note.

† Law, James, *Veterinary Medicine*, 1911, Vol. II., p. 96.

per reduction method. Red and white clover blossoms, alfalfa blooms, blue grass flowers, clover and alfalfa leaves were thus examined. That there is an appreciable quantity of sugar in the fresh flowers of alfalfa and of red and white clover is shown in the Table I. This table also shows that the sugar content of alfalfa and clover leaves and of bluegrass flowers is very small.

TABLE I.

Quantity. Grams.	Variety.	% of Sugar by Weight.
15.80	Fresh white clover flowers.....	2.43
8.00	Fresh white clover flowers.....	1.80
10.80	Fresh white clover flowers.....	1.21
13.60	Fresh red clover flowers.....	3.67
12.35	Fresh alfalfa flowers.....	2.88
8.00	Fresh bluegrass flowers.....	0.93
8.00	Fresh clover leaves.....	0.46
12.35	Fresh alfalfa leaves.....	0.67

That such flowers withering upon the stalk, or drying upon the laboratory table without fermentation, do not lose their sugar, is shown in Table II. Very similar conditions would occur during hay making in suitable weather.

TABLE II.

Quantity. Grams.	Variety.	% of Sugar by Weight.
12.10	White clover flowers withered on stalk..	1.58
7.70	White clover flowers withered on stalk..	1.21
2.60	White clover flowers dried in laboratory.	2.09
2.45	Alfalfa flowers dried in laboratory.....	2.24
2.45	Alfalfa leaves dried in laboratory.....	1.26

That a natural fermentation will occur, whereby the sugar present in these flowers is all converted is shown by the following experiment: The conditions are similar to those which would occur if a cow ate heartily of fresh, moist clover blossoms. A quantity of fresh clover blossoms was placed in a closed jar and fermented at room temperature for six days. The blossoms turned brown, then dark brown, and finally almost black. At the end of six days, 50 of these fermented clover heads were tested for sugar and found to contain none. A wild, top-fermentation yeast of the variety *S. ellipsoideus* II. was isolated from the water which had collected in the bottom of the jar.

That this process was a true and active fermentation was demonstrated in the following manner: 63 grams of fresh white clover blossoms were placed in a closed bottle, which was then connected with a flask containing 175 c.c. of freshly prepared lime water. Fermentation was allowed to proceed at room temperature, and at the end of 72 hours the flask contained a heavy precipitate of calcium carbonate.

In view of the fact thus demonstrated, that fermentation was the cause of bloating following the ingestion of fresh clover and alfalfa blossoms, Dr. Joseph H. Kastle suggested the control of this condition by the administration of formaldehyde. This we succeeded in doing in the following case reported by Mr. Nutter: "Lads Oona" bloated badly on white clover June 13, 1913. She was drenched with one litre of water containing 40 c.c. of formalin, that is, 4 per cent. formalin or 1.6 per cent. of formaldehyde; a block of wood was, at the same time, placed in her mouth, thus keeping it open. At the end of twenty minutes she had entirely recovered.

We have not had another opportunity of testing this treatment, but will test it thoroughly when the opportunity occurs. We do not hesitate, however, to strongly recommend for acute bloating one quart of a 4 per cent. solution of formalin, followed by placing a wooden block in the mouth and gentle exercise if the animal can be gotten up.

PREScribing AND PRESCRIPTION WRITING.*

By I. L. SALLEY, D.V.S., Skowhegan, Me.

From time immemorial it has been the custom of veterinarians, and physicians as well, to use certain favorite prescriptions which have been handed down from ages.

These prescriptions were compounded many years ago by men whose scientific knowledge could not be up with men of to-day, and some of them probably by quacks.

In the beginning of the practice of medicine all were quacks, for, of course, they had no schools upon medicine to attend, no books to read as we have.

It is not at all surprising if these men should try and get a little of almost everything into their prescriptions, so that if one thing does not hit the case something else will.

These men were guessing, and it is probably the case that they figured that the more shot they had in their charge, the more likely they were to hit the mark. I don't suppose they took into consideration what damage they might do to things surrounding the mark by stray shot. You have heard of these gunshot prescriptions and I presume part of us have used them.

But in this we may excuse ourselves, and lay part of the blame to our Alma Mater. Who of us cannot remember the colic drenches, fever mixtures and tonic powders, etc., which we were taught to use. What the actions are, of some of these mixtures I have seen, it would take an expert with a big piece of paper to figure out.

I am not blaming the schools, for the professors were taught these things by their teachers, and so on it has been handed down.

Neither am I trying to criticize anybody; what I am trying to point out is, that I believe the use of conglomerations is

* Read before the Maine Veterinary Medical Association.

not scientific and should not be used by men who pretend to treat disease in a reasonable way.

It is all well enough for the quack to use these prescriptions with all the drugs in the pharmacopeia, because he has to; he is guessing all the time. But there are many things that a D. V. S. ought to know, and I believe he ought to apply this knowledge in prescribing and compounding the medicine for his patients.

I suppose some may think that if they can write a prescription with a lot of symbols that the laity do not understand, that their knowledge will appear to be according to the length of their list of drugs. I believe it better, in writing a prescription, to use just as few drugs as possible; very often one alone, sometimes two, with possibly a vehicle and maybe a corrective; but seldom should we need more.

I also think it better to carry in our cases straight drugs mostly, and mix them for each individual case at the time; for we will seldom find the same disease that requires just the same treatment. Hence, in the colic drenches we seldom find a case of colic that requires all of the things in the drench, and if a drug is not required it had best not be given. I do not believe in taking medicines to keep well; they should only be taken to correct some defect, and when the trouble is removed, stop the medicine.

When called to treat disease first make an accurate diagnosis, as you can then give the least number of drugs possible to correct the trouble and give in doses large enough and long enough to get the full effect of the medicine, and carefully watch the result.

A "GET-TOGETHER" MEETING IN COLLINSVILLE, ILL.—Dr. L. B. Michael, of Collinsville, Ill., has made preparations to have the veterinarians of southern Illinois "just get together where everybody has the floor," as the doctor has expressed it, at Collinsville, on November 15, 1913. Dr. Michael has arranged for a clinic in the morning to commence at 9 o'clock, and a session in the City Hall in the afternoon. The doctor desires anyone who for any reason does not receive an invitation to regard this notice in the REVIEW as an invitation and come to the meet.

REPORTS OF CASES.

GASTROTHORACOPAGUS.

By CHAS. T. FREY, V.S., River Point, R. I.



This photo is one of a monstrosity taken from a large Holstein cow owned by one of my clients. On August 23, 1913, on arriving at the farm about 8 p. m., I found a posterior presenta-

tion, two hind feet in sight; made an examination, and proceeded, with assistance, to deliver the calf that way. We pulled until the hips came in sight, then could not get it any further. I then put it back, and tried to turn it; after some time I succeeded in getting the head and one forward leg, and after working awhile I found *three* hind legs. We pulled at the head but could not get the calf. I cut the head off and made another examination. I then told my client that we could not deliver it without dissecting it, which would be somewhat harsh for the cow, and from her experience that day, both before and after I got there, I did not think that she would make a good recovery; I therefore advised killing the cow. My client consented and the cow was destroyed that night. The owner drove down to my place the next morning with the calves, minus the head of one that I cut off, explaining that the dogs got it before he killed the cow and he could not find it. I am sending this to the REVIEW as it may benefit some of my brother practitioners. The calves were of normal size, in fact every way normal except the union from the sternum to the udder. They were both heifers.

THE MILK QUESTION is very ably dealt with in a most interesting address by Dr. Evans, of Chicago, delivered at the opening of the last day's session of the A. V. M. A. in New York, published on page 178 of this issue. The address was so excellent an one, by such an authority as former Health Commissioner Evans, of Chicago, that we have published it as early a date as possible that all our readers who were not fortunate enough to hear it from Dr. Evans' lips may read it here.

A FERTILE MULE.—On page 251 of this issue, Prof. Liautard cites the case of a mule having a foal; that being her second one. The case was reported in the *Veterinary Record*, from which it was also abstracted by the *Field Illustrated*, New York. This brings to our mind a case of lactation in a mule reported by us in the REVIEW, fully illustrated, on page 749, January, 1901.

DR. HUGH RUSSELL HOPKINS, class of 1911, New York-American Veterinary College, died at his home in Jersey City, N. J., on August 24, 1913, of tuberculosis, after an illness of fourteen months, in his 26th year.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

THE TREATMENT OF PLEURITIC EFFUSIONS [*Capt. P. V. Beatty, A.V.C.*].—The minute record of a case which had occurred in a well bred pony mare, five years old, and had recovered after treatment of principally punctures of the chest and in which tapping was performed ten times in the space of six days, the total quantity of fluid removed being seventeen gallons and two pints. The mare was in no way upset by the operations. Improvement had been noticed after the first puncture and was maintained in proportion to the amount of fluid removed. Tapping was discontinued when the pulse and respiration had been normal for some days. It is probable that some fluid remained, but was reabsorbed in the course of time. The case was not afterwards complicated by synovitis nor lameness as not uncommonly found in similar cases.—(*Veter. Record.*)

CONGENITAL INTESTINAL DEFECT IN A FOAL [*J. F. Craig, M.A., M.R.C.V.S.*].—This was recognized only at post mortem and was unexpected. It was in a thoroughbred filly, which on the day following her birth was observed to be constipated and had passed no meconium. Laxatives and enemas were useless. The little animal died on the third day and the autopsy was made 24 hours after. Abdomen was tympanitic and bloody extravasation was observed under the peritoneum. There was some blood stained fluid in the peritoneal cavity. The large colon was represented by a single column of bowel, arranged in the normal position, bent on itself behind the xyphoid cartilage of the sternum. The blind extremity was directed backwards towards the pelvis. This piece corresponded to the first and second portion of the double colon. The third and fourth portions were absent. The bowel had four longitudinal bands near the cœcum, two of which gradually disappeared. The only opening in connection with it communicated with the cœcum. The blind extremity corresponded with the pelvic flexure of the normal

colon. The cœcum contained three pounds of meconium. The small colon ended in front by a rounded blind extremity, at the roof of the abdomen, on the left side behind the point at which the duodenum is continuous with the remainder of the small intestine. There was no continuity between the large and small colon, which was continuous with the normal rectum. The anus was quite normal.—(*Veter. Journ.*).

GASTRIC TYMPANY [*Guy Sutton, F.R.C.V.S.*].—Gelding had eaten a considerable quantity of oats. Next day he is very ill. Colic, etc. No relief is obtained by treatment. After 18 hours the condition is critical, cold sweat, unsuccessful attempts at vomiting; abdomen enormously distended. Only a horse catheter is at hand. It is passed up the nostrils, through the œsophagus and reached the stomach. The result is magical. Spray was shot from the mouth of the catheter for at least a yard, and gas escaped with hissing noise. The horse was instantly relieved.—(*Ibidem.*)

OVARO-HYSTERECTOMY IN AN UNCOMMON CASE [*J. Peddie, F.R.C.V.S.*].—Bull bitch was pregnant by a large size retriever and has great difficulty to deliver. Five pups are removed from her easily, but only part of another could be taken out when the writer was called. A large pup is still in a horn of the uterus. Vaginal examination reveals nothing. An operation is indicated and consent of the owner given. After careful anesthesia, the abdomen was opened and the uterus exposed. The walls of the organ are very thin, the right horn is ruptured in two places. From the largest tear, one-half of the complete puppy was protruding in the abdominal cavity; the remainder of the pup, part of which had been pulled away, had come by a breech presentation and was in the right horn. Ovaro-hysterectomy imposed itself and was carefully performed. The dressing was made and kept by adjusted abdominal girth. The bitch did well, having only on the 9th day a small hernia of the omentum, which was reduced and the opening closed by sutures. After this recovery followed.—(*Veter. Jour.*)

RENAL SARCOMA AND PROSTATITIS IN A DOG [*F. J. Taylor, M.R.C.V.S.*].—Aged Aberdeen terrier has trouble in using his hind legs, he micturates frequently. Some times the urine is stained with blood. He has obstinate constipation, his back is

arched and he is very sensitive to pressure on the loins. The prostate is much enlarged and readily felt, by rectal examination, surrounding the neck of the bladder. Each lobe is almost the size of a bantam's egg. The owner refuses to have him castrated and the dog is destroyed, after some unsuccessful attempts with the iodides. The postmortem revealed a growth of glandular tissue, surrounded by dense, hard muscular tissue and the left kidney hypertrophied. The bladder was thickened from cystitis.—(*Ibidem.*)

DISEASE OF MIDDLE EAR—LINGUATULA TÆNIODES IN NASAL CHAMBER OF AN OTTER HOUND [*H. Tudor Hughes, M.R.C.V.S.*].—Otter hound, six years old, was taken ill suddenly, seems to suffer from inco-ordination of movement, carries his head low and to the left. He had advanced condition of canker in the ears, worse in the left. He grew worse and was killed as incurable. *Postmortem*: Female linguatula tæniodes found in the right nasal cavity. It was alive, although the dog had been dead two days. External auditory meatus of the left side was crammed with impissated discharge. The middle ear contained a small quantity of bloody effusion, which run out when the ear was opened. The lining membranes and the tympanum being thickened. There was also discharge in the right ear, but the middle ear of that side was normal. The discovery of the linguatula was a surprise, as the dog had shown no clinical symptom of its presence. The dog must have been affected about six months at least, as the female parasite was fully matured. No male parasite was discovered.—(*Veter. Record.*)

MULE MARE WITH FOAL [*Government Veterinary Surgeon G. J. Hartey, M.R.C.V.S.*].—The writer says: "I examined the subject and found it a genuine mule. Should say it was bay with black points, six years old. This foal is the second. The first was a filly last year. This one is a male. The first died after two months, the second lives. The mule was bred from a she-donkey, and the foals from her are by a jack. No special marks or stripes. The mule was giving milk and the foal sucking. He somewhat resembles a young donkey, but bigger. The dam is a genuine she-mule." A nice photo illustrates the record.—(*Veter. Record.*)

AN OPEN JOINT [*W. Brown*].—Very interesting case with a moral. "Submit your diagnosis to further consideration, as well as your patient."

A horse has a small punctured wound, six inches below the elbow joint, discharging small quantity of blood-serum. The animal is not lame and the case is considered as a simple one, as there is no history of any accident being the cause. Simple treatment is ordered but the case gets worse. Swelling of the joint, pus is formed round the point of the elbow, it is allowed to escape. The wound healed but the animal, which had been put in slings, remains very lame. Then the original puncture began to discharge synovia, continuous cold douches are prescribed. The condition does not improve. The owner gets tired and finally the horse is destroyed. *Lesions found at autopsy:* Underlying tissues, over the area of the original wound, broken down and purulent. There is infiltration of synovial fluid. The joint is involved, with the surface of the inner condyle of the humerus eroded and fractured, the head of the ulna is fractured and the radius the seat of a splintered fracture. *Moral: First examination and also subsequent, had not been sufficient because of a preconceived diagnosis—manly acknowledged by the author.* (Ed.)—(*Veter. Record.*)

CLOVE OIL IN OPEN JOINT [*F. J. Dunning, G.V.S.*].—Lame horse had small wound on outside of the leg about an inch below the fetlock. It is not probed, and a few days after a splinter of wood came out. The leg swells, pain is great, excessive lameness, synovia escapes very freely. Corrosive sublimate lotions and antiseptic dressing are resorted to. Animal gets worse. One cubic centimeter of oil of cloves is injected twice a day and antiseptic bandage put on. Granulations rapidly filled the cavity, even proud flesh develops and completely closes the wound. Swelling of the leg remains but with bandaging and later blistering is gradually removed.—(*Ibidem.*)

FRENCH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

BONY TUBERCULOSIS OF FOWLS [*MM. Chretien and Raymond*].—Besides the classical lesions of the glands and viscera observed in fowls, there exist lesions of the bony system, which have not yet received special study. The writers have noted them in more than 90 per cent. of the tuberculous birds they have examined. The lesions are in the various parts of the skeleton, where bony marrow is found. They are easily observed, especially in the femur and tibia, where if the bones are opened lengthwise they appear here and there. At the beginning of the disease,

there are in the marrow small centers of softening greyish in color, poorly defined, which rapidly become caseous, semi-solid, yellowish and clearly distinct from the dark red coloration of the marrow. In the ribs and other bones the lesions are also frequent and have the same aspect. There are sometimes macroscopic bony deformations. All these lesions contain tuberculous bacilli in great quantity. They even exist in the marrow outside of all macroscopic lesions.—(*Hygie-de la Viand. et du Lait.*)

ARTICULAR WOUNDS—THEIR TREATMENT [*Capt. Dignac Army Veterinarian*].—In the records of three cases that the writer makes, he confirms the indications that we alluded to in the Chronicle, on the subject of traumatic arthritis, and brings with some little difference or modifications the authority of his success to this treatment of articular wounds, namely, simply the suture of the wound. The hair is clipped round it, the region coated over with tincture of iodine, sutures with Florence hair or pins with aseptic precautions and friction on and around the wound of biniodide of mercury ointment. Recovery is rapid, generally inside of a week, but return to work only after 10 or 15 days.

In a first case it was a wound of the right hock, where there was hydrarthrosis. The synovia was escaping, the synovial inflamed and the animal was very lame. After an injection of anti-tetanic serum, the wound was dressed as above. Improvement the next day and recovery in two weeks.

A second similar case resumed work in ten days. In the third case there was suppurative arthritis of the left temporo-maxillary articulation with complete recovery in 16 days.—(*Revue Gener.*)

PARTURIENT APOPLEXY WITH RELAPSE [*M. H. Brissot*].—If such cases are common, says the writer, he has failed to find any record of them and besides, classical works do not mention them. Recently delivered, an ordinary bred cow has all the symptoms of parturient apoplexy, between 24 and 36 hours after calving. Classic treatment is applied at once. Insufflation of the udder, subcutaneous injections of one gramm of caffeine in two doses, cold water compresses over the head. Result, the cow is up after three hours of illness. Twenty-four hours later she is not so well. The mammae have been squeezed out of the air inflated. On the next day all the symptoms have reappeared; sterno-abdominal decubitus, bending of the head and neck, temperature 38.1° C. pulse small, etc. Feces are dry, hard, with bloody mucosities. Urine is clear and albuminous. Same

treatment is resorted to and the next day the cow is convalescent.
—(*Rec. de Medec. Veterin.*)

ABSCESS IN LEFT CEREBRAL HEMISPHERE [*Capt. A. Videlier, Army Veterinarian*].—Eight-year-old horse, suddenly drops in his stall one morning and cannot get up. Sinapisms of mustard are applied on the four legs, 3 litres of blood are taken from the jugular. The horse succeeds in getting up, but immediately falls down again, his legs being unable to support him. Caffeine and camphorated oil are injected subcutaneously and another bleeding at the jugular performed. The animal lays down, gets up and drops again, he raises the head, has sudden contractions of the legs. Diagnosis is uncertain. After 13 hours the animal dies. Every organ was found normal at the autopsy except the brain. The right hemisphere is normal, but when the left is opened, abundant creamy suppuration escapes. In the posterior region of the hemisphere there was a closed abscess as big as a nut, whose origin was not made out, perhaps from strangles.—(*Ibidem.*)

HYPERTROPHIC CIRRHOSIS OF THE LIVER IN A HORSE [*D. Guillaume and Chaumay, Army Veterinarians*].—Anglo-Arab, six and half years old, has been losing flesh notwithstanding various regimes and treatments. He is very thin, coat staring, looks dull and tired, appetite is capricious. His temperature is 37.8° , pulse 42, respiration 12. The visible mucous membranes are highly congested, that of the mouth is purplish. The tongue is moist. There is frequent grinding of the teeth. Nothing abnormal in the chest. The abdomen is pendulous and the flank hollow. There is dullness on the right side from the 12th rib to the last, extending downwards from the external border of the ileo-spinal groove to the lower third of the thorax. No dullness on the left side. Urine is thick and red orange in color. Diagnosis of gastro-enteritis with probable hepatitis is made and tonic treatment prescribed, after proper attendance to the teeth. For two months no improvement took place. There has been no change in the symptoms except a weakening of the heart's action and an increase in the size of the zone of dullness on the right side. It spreads in the hypochondriac region and is also detected on the left side, on the upper third of the chest. Iodide of potash and digitalis are ordered. Then the two hind legs are taken with severe lymphangitis. Swellings and formation of small abscesses which being opened give out thin, sanious pus. The animal continues to lose flesh and finally dies after an illness of

nearly four months. The principal lesions found were in the liver, which weighed 19 kilograms and presented all the characters of hypertrophic cirrhosis.—(*Bullet, de la Soc. Centrale.*)

DERMATOMYOMA IN A CAT [*Prof. Doct. V. Hall*].—This tumour, very rare in man, is still more so in animals. The writer has seen one in a six-year-old cat. He had on the right side a little out of the median line and back of the shoulder a bosselated tumour, ovular, involving the dermis and hypodermis and measuring 8 centimeters in length and 8 in width. On its surface, the skin had some alopecia, and appeared slightly translucent at one point, where there existed a fistulous opening through which escaped brown yellowish fluid. The tumour was firm and on section exhibited a cavity with granular walls. On the left side of the thorax, there was another small tumour. These growths were dermatomyomas, being constituted of masses or fasciculi of smooth muscular fibres, easily recognized by their form, their nucleus and their facility to take coloring matters. The origin of dermatomyomas in man is supposed to be in the neoplastic evolution of the muscular fibres of the *arrector muscles* of the hairs, or the muscular cells of blood vessels.—(*Journ. de Zootechn.*)

MELANOTIC SARCOMA WITH CUTANEOUS AND POLYVISCERAL METASTASIS IN A DOG [*M. Sammon*].—Gordon setter, five years old, becomes suddenly severely lame on the left fore leg. He has a swelling of the extremity of the internal toe, which though treated and opened with a hot iron gets worse. The dog walks on three legs and is losing flesh. The swelling is as big as an hazel nut and through its open center shows a suppurating black surface of ugly aspect. The toe had to be cut off and the dog seemed to have recovered. A few months later he had on the base of the neck in front of the left shoulder a very large tumour, as big as the fist. This suppurated and contained dirty black looking pus. Other tumours made their appearance on the skin, on the right flank, in the muscles of the abdomen, and notwithstanding great care the dog had to be finally destroyed. At the post mortem, centers of melanotic formations were found in all the organs except the liver, which was entirely free from them.—(*Ibidem.*)

GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

CONCERNING THE ACTION OF PETROLEUM [*Prof. Kauffman*]. It is well known that necrosis accompanied with suppuration is very difficult to heal, particularly when affecting cartilaginous

tissues, tendons and ligaments, because on the one hand in these organs the vascularization is not sufficient to compensate for the loss of vital action in the parts throughout the inflammatory process, and on the other hand the necrosis in the deeply protected parts in which bacterial infection is active, is difficult to treat. The necrotic layer prevents direct contact of the antiseptic remedy with the inflamed living tissue cells. The author has used petroleum for the last ten years with constant success in poll-evil, fistulous withers and cartilaginous quittors, in necrosis of the aponeurosis of the flexor tendons, in suppurating articular inflammations and in caries of the maxillae. In general it is an excellent antiseptic; it has also the properties of being easily applied and of being introduced into the narrowest fistulous openings and there impregnating the tissues.

It never irritates wounds, only those lesions of the skin in contact with hair. In order to prevent this an application of fat to the wound must precede the use of petroleum in order to protect the skin and keep it pliant. When petroleum comes in contact with necrotic tissue, it rapidly dissolves the colloidal substances which impregnate the necrotic layer, dissolves the latter and renders aseptic the inflamed underlying tissues without harmful effect. In order that the petroleum may gain entrance to all diseased parts a careful and methodical system of drainage of the fistula is an absolute necessity. Usually a cure is effected in this manner in about eight days. Nevertheless it occurs frequently about this time in the treatment of cartilaginous quittor and fistulous withers that new fistulae are discovered which had not been previously noticed and which become remarkable through painful indurations in the midst of soft painless swellings. These heal rapidly by establishing a second system of drainage and another application of the remedy. The author concludes his treatise with the following remarks. 1st. Petroleum is an excellent antiseptic agent, it is also possessed of particular properties which renders it desirable for the treatment of necrotic inflammation of the tissue cells when in a condition of lowered vitality. 2d. The treatment of bacterial necrosis with petroleum gives much more rapid and certain results than that of any other classical procedure. 3d. In order to attain the best results with this preparation, the diseased parts must be thoroughly impregnated.—(*Berliner Tierärztliche Wochenschrift* Nr. 12, 1913.)

CALF SCOURGE AND SEROTHERAPY [*Dr. Ettore Gentili in Parva.*].—In Lombardy calf scourge is said to be due to various infectious and contagious diseases of the newly born calf as dysen-

tery, polyarthritis and septic pneumonia. In so far as dysentery and polyarthritis are concerned, according to the results of the investigations of Prof. Stazzi and particularly the more recent investigations of the author, they are due to a colon bacillus, in a few cases bacteria of the paracoli and paratyphus group and once the bacillus pyocyaneus was observed to be the cause of the disease. As an effective remedy for the eradication of this malady, Prof. Stazzi obtained a polyvalent serum from horses which were treated with a virulent strain of the coli bacillus. This serotherapeutic remedy must be applied if successful results are to be attained in a few hours after birth or at most before the sixth hour of life has expired. As a result of the timely application of the protective serum in many localities where for more than three years the calf scourge had prevailed uninterruptedly the mortality has been reduced from 95-100 per cent. to 0 per cent.

Where unsuccessful results were attained it could be traced to delay in the application of the remedy or to too small a dose of the serum or to some technical error.

There is also a very grave form of disease attacking the newly born calf which according to the investigations of the author is caused by infection with the Bang-Stribolt abortion bacillus and which follows a course similar in symptoms to calf dysentery. The serotherapeutic experiments to combat this particular form of disease are at present not concluded. However, it may be stated that favorable results are anticipated.—(*Berliner Tierzt. Wochenschrift* No. 18, 1913.)

EXTERNAL REMEDIES IN MEDICINE—GLYCERINE APPLICATIONS [*Dr. Sustmann in Verden.*].—Sustmann, on the ground of his experience lauds the action of glycerine in external diseases. He has shown that the antiputrefactive action of this remedy had been recognized for many years past, that it had been used in combination with tannic acid, boric acid, iodoform, and so on, in the treatment of cutaneous diseases; however, notwithstanding this, its use has been abandoned because many other remedies have been placed upon the market as substitutes. In the treatment of open wounds the official glycerine ointment may be used instead of glycerine.

Sustman experienced success with glycerine salve in conjunctivitis in combination with the agents previously mentioned, also in the treatment of saddle galls, chafing, eczema, mallenders, erythema, skin wounds, ulcers, knee abrasions. The use of glycerine applied with a bandage in chronic sores and ulcerating wounds and similar conditions with an accompanying cellulitis has a bene-

ficial action, also in cases of interfering when the fetlock is injured. On the contrary, spontaneous phlegmon or similar processes do not respond to the glycerine treatment.

The addition of boric acid, tannic acid, iodine, iodoform, creolin, and so on, is not absolutely necessary; although it cannot be denied that the addition of these agents have a specific action on skin lesions. Sustmann never observed disagreeable secondary effects from the use of glycerine in his practice.—(*Deutsche Tierärztliche Wochenschrift*, 1912, Nr. 12.)

SHEDDING OF THE PROTECTION HAIRS AS A SECONDARY DISEASE TO A SEVERE CASE OF INFLUENZA PECTORALIS [*Chief Vet. Kegler*].—As a secondary disease to a severe case of influenza pectoralis, Kegler observed in a five-year-old gelding shedding of the hair of the tail, mane and foretop, which was not only remarked in the cleaning of the animal but was also spontaneous in character; and not only the long hairs were shed individually but also in tufts while the short hairs remained firm. Abnormal exfoliation of the cuticle was not present neither was a diseased condition of the individual hairs nor a pruritis observed. The treatment consisted of clipping the protection hairs, disinfecting baths of sublimate solution 1 to 1,000 and applications of balsam of peru and spirits equal parts.

Kegler regards the loss of hair as probably due to the severe attack of influenza and to the prolonged convalescence as a result of the ill nourished condition of the animal.—*Zeitschrift für Veterinärkunde*, 1912, 6 Heft, S 278.)

PURULENT CATARRH OF THE FRONTAL AND MAXILLARY SINUSES IN A HORSE AS A RESULT OF THE ACCUMULATION OF FOOD STUFF DURING MASTICATION.—A rare case of catarrh, purulent in character of the frontal and maxillary sinuses was reported from the district of Adelnau as occurring in a horse. The symptoms were a nasal discharge from one side only, bulging of the frontal bones, swelling of the laryngeal lymph glands and emaciation. The animal was destroyed and in section there was found between the first and second molars on the left side a cavity filled with food stuff. The left superior maxillary and both frontal sinuses were packed with food material.

The frontal septum had completely disappeared. The wad of compressed food removed from the frontal sinuses resembled a skittle ball in size and shape.

The frontal sinus was inflamed and its walls were covered with a layer of pus 1 mm. in thickness.—(*Veröffentlichungen aus den Jahres-Veterinar-Berichten der beamteten Tierärzte Preussens für das Jahr 1910. Berlin 1912. 1. Teil. Seite 45.*)

CORRESPONDENCE.

OXYGEN 'SUBCUTANEOUSLY.

HARTSHORNE, Okla.

Editors AMERICAN VETERINARY REVIEW, New York:

Have you published anything in the AMERICAN VETERINARY REVIEW on the subcutaneous use of oxygen as a therapeutic agent during the past five years? If so, in what issues; and if not, do you expect to publish anything on this subject in the near future? I am very much interested in the subcutaneous use of oxygen as a therapeutic agent in my practice for human beings and would like to know if any veterinarian has ever used oxygen subcutaneously as a therapeutic agent in practice among animals; and if so, with what results.

I cannot find much literature on the subcutaneous use of oxygen in the English language. It occurs to me that oxygen has been used subcutaneously with good results in various diseases in Europe, but as far as I can learn, the subcutaneous use of oxygen in America is practically unknown and has been used very little. There are a few abstracts from foreign journals in the *Journal of the American Medical Association*, August 3, 1912, page 404; November 16, 1912, page 1830, and March 26, page 1401. The Roessler and Hasslacher Chemical Co., 100 William street, New York, issue a small amount of literature on the subcutaneous use of oxygen and make an apparatus for giving oxygen subcutaneously to human beings. I feel satisfied their apparatus would be sufficient to give oxygen subcutaneously in veterinary practice, and mention this matter for the benefit of those who wish to try it; for this is the only house I know of in the United States that supplies such an apparatus. I fully believe that the subcutaneous use of oxygen deserves due consideration and investigation from both physician and veterinarian and I write this to stimulate investigation; and would be pleased to hear from any one on this subject as to results either good or bad, and to receive reprints of articles on this subject. The veterinarian is in a good position to investigate

this subject, as the remedy is cheap and he could get proper clinical material.

If the veterinarian would take this in hand, then we physicians in human practice could learn much from them as to the technique of the injection, the physiological effect, therapeutic action, contra-indication, and dosage.

I hope at least the laboratory of some veterinary school will take this subject up for a thorough investigation.

Apparently the subcutaneous use of oxygen promises much in a great variety of diseases in human practice, and I feel sure it would be of equal value in veterinary practice. Subcutaneous or hypodermic medication of various remedies is constantly growing in favor the world over.

J. A. BURNETT, M.D.,
Member of Pittsburg Co. and Oklahoma State
Medical Associations, and Fellow in the American
Medical Association.

EUROPEAN TOUR—TENTH INTERNATIONAL CONGRESS.

Washington, D. C., October 21, 1913.

Editor, AMERICAN VETERINARY REVIEW, New York City.

I am herewith forwarding to you a letter which I received from Prof. Francis Hutyra, relative to our proposed European tour in connection with the attendance of the Tenth International Congress at London in 1914.

I am very glad to know that there is a great deal of interest manifested by members of our profession in the tour and the congress, and from all indications we hope to have a creditable delegation from this country.

As secretary of the National Committee of the United States for the Tenth International Veterinary Congress, it would probably be advisable at this time to call to the attention of the members of our profession in this country that in order to become members of the International Congress a fee of \$5 is required, in return for which all publications, including the final report of the proceedings in several volumes, will be sent to all members. The possession of this alone would more than repay the members for their expenditure. It can not be expected that all those who would desire could personally attend the Congress

at London, and at the same time they would appreciate becoming members of the Congress. I would request all those who desire to attend to inform me of their intention at an early date, in order that arrangements for reservations can be made.

I beg of you to publish the letter of Prof. Hutyra, which indicates the interest which will be shown towards our touring party, and we will make an effort to secure proper attention from the authorities in the different countries to be visited for the benefit of our traveling veterinarians.

Very respectfully,

(Enclosure.)

ADOLPH EICHHORN.

—————
Budapest, September 29, 1913.

DR. A. EICHHORN, Department of Agriculture, Washington,
D. C.

My dear Colleague:—From your letter of September 16, I have learned with the greatest pleasure and with the feeling of my deepest sincere gratitude of the honoring distinction which was shown to my humble person by the American Veterinary Association in electing me as an honorary member. Even until I receive the official notification, so that I may express directly my appreciation, please accept and express to all those colleagues who were kind enough to recommend me for the honor the sincere expression of my warmest gratitude.

I have also learned with the greatest satisfaction your kind information that the second edition of our textbook is already in preparation.

At last but not in the least agreeable was your news that a party of American veterinarians contemplates visiting Hungary on the occasion of an European study tour. It is natural that we will aim to make their stay with us as pleasant as possible. Nevertheless, according to my view, it would be advisable to have the Government of the United States inform the Hungarian Government through the diplomatic representative of the visit, as in that case our Government would without a doubt more likely and to a greater extent make all arrangements for a comfortable visit and proper entertainment at the stock breeding establishment of Mezohegyes, Balbolna and Kisber.

Again expressing my best thanks, I am, with kindest regards,

Sincerely yours,

(Signed) FRANCIS HUTYRA.

HARVARD UNIVERSITY MEDICAL SCHOOL, BOSTON, MASS.

September 23, 1913.

The Editor, AMERICAN VETERINARY REVIEW, New York City:

I had opportunity this summer to witness the extent of hog cholera in Southern Iowa. The rapidity with which it spreads makes it appear as if there were other agencies than those commonly described as transmitting the virus, such as shoes, stock, wagons, birds and fowls which have come in contact with the infected discharges, carrying it to uninfected premises. To me it seems very probable that some biting insect may take an important part in assisting in the rapid spread of hog cholera over wide areas. This summer *Stomoxys calcitrans*, the common stable fly, was very abundant in Southern Iowa, and I observed it biting hogs (on the ears) on premises where hog cholera existed and on others where hog cholera had not as yet made its appearance. The character of the disease, *i. e.*, septicæmia, would make it possible for a biting insect to materially assist in the dissemination of the virus, in addition to the other agencies commonly described.

Yours truly,

MARK F. BOYD.

MARSHALL, Ohio, September 26, 1913.

Editors AMERICAN VETERINARY REVIEW, New York:

SIRS—Following are a few questions that I have not had satisfactorily explained:

(1) What would be the result if an animal have both vas-deferens severed by a clean surgical operation, the testicles and all left in their normal position, none of the reproductive organs being disturbed?

(2) Will a cow conceive and carry the foetus full term if she has had her udder removed while she was a calf, and if so, is she any more subject to parturient apoplexy than one with a normal udder?

(3) Is the venous circulation harder to gain access to by invading bacteria than the lymphatic circulation in contagious diseases contracted by invasion through the mucous membranes?

Yours truly,

A. W. SELLERS, D.V.M.

BIBLIOGRAPHY.

POCKET CYCLOPEDIA OF MEDICINE AND SURGERY.

GOULD AND PYLES POCKET CYCLOPEDIA OF MEDICINE AND SURGERY. Based upon the Second Edition of Gould and Pyles Cyclopedia of Practical Medicine and Surgery. Second Edition; Revised, Enlarged and Edited by R. J. E. Scott, M.A., B.C.L., M.D., New York. Formerly Attending Physician to the De Milt Dispensary; Author of the State Board Examination Series; Editor of Witthaus' Essentials of Chemistry and Toxicology and Hughes' Practice of Medicine, etc., etc. Philadelphia, P. Blackiston's Son and Co., 1913. Cloth \$1.00 net.

This neat little volume is a pocket abridgement of the standard Cyclopedia of Medicine and Surgery by the same editors, and contains, in addition to a complete medical dictionary with illustrations of surgical conditions, and ten pages of tables of the principal arteries, making the study of their origin, distribution and branches simple and rapid, tables of weights and measures, a physician's dose-table which occupies 19 pages, giving the dosage of drugs in both the apothecary and metric systems. Upwards of 30,000 copies of the previous edition have been sold here and abroad. In this revision the general plan remains as before but a large amount of new material has been incorporated, the number of cross references has been largely increased and the editor has kept in mind the wants of the general reader in search of immediate information. It is *multum in parvo* and is invaluable. Bound in soft black leather with round corners, and lettered in gold (the leaves being also gold-edged), this little volume, $6\frac{1}{4} \times 3\frac{3}{4} \times \frac{3}{4}$ fits easily in the inside pocket of any coat, providing the physician or veterinarian with accurate medical or surgical data, readily accessible at all times, whether walking, driving, train-riding or elsewhere.

A COMPEND ON BACTERIOLOGY.

A COMPEND ON BACTERIOLOGY, INCLUDING ANIMAL PARASITES, by Robert L. Pitfield, M.D., Pathologist to the Germantown Hospital; Late Demonstrator of Bacteriology at the Medico-Chiurgical College, Philadelphia; Visiting Physician to St. Timothy's Hospital and Chestnut Hill Hospital, Philadelphia. Second Edition, 280 Pages with 4 Plates and 85 other illustrations. Philadelphia, P. Blackiston's Son and Co., 1913.

This little book was designed by the author, more especially to meet the needs of the medical student preparing for examina-

tion, which makes it eminently fitted to the uses of the practitioner (medical and veterinary) who desires to keep abreast with the principal facts of the rapidly growing science of bacteriology. For that reason the subject matter has been made as concrete as possible.

The chapter on immunity gives in outline the essential accepted teachings on that important subject. The work is divided under eleven headings, as follows: (1) The Classification, Morphology, and the Biology of Bacteria; (2) Products of Bacterial Energy; (3) Infection; (4) Immunity; (5) Study of Bacteria; (6) Bacteriological Laboratory Technic; (7) Antiseptics and Disinfectants; (8) Bacteria; (9) Animal Parasites; (10) The Filtrable Viruses; (11) Bacteriology of Water, Soil, Air and Milk. The author has drawn freely from many standard text-books. Many illustrations are from Kalle and Wassermann's Atlas, Williams, McFarland, Tyson and others. The work being well illustrated, and in its condensed form makes a ready reference book for both the veterinarian and the physician, more especially adapted to the needs of the latter. The publishers are to be commended for the manner in which they have executed their work.

DR. A. D. MELVIN HOME.—Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, U. S. Department of Agriculture, has returned from a trip to South America, where he had been studying the stock-raising and meat industries, and the possibilities in regard to their future extension, as an agent of the United States Government. The doctor reports his trip as a pleasant and instructive one, and is glad to have had the opportunity of making it; but, as is the case with all men from the "States," it has impressed upon him the fact that "the United States of America is the best country in the world." The doctor reports having met a number of very high-class veterinarians, all of whom are occupying government positions. By the way, rumor has it that Dr. Melvin himself had accepted a position in Argentina and was to return there in the near future at a high salary. That rumor is entirely erroneous, and the doctor desires that impression corrected through the medium of the REVIEW, as he has no intention of leaving the United States.

ADDRESS OF SECRETARY OF AMERICAN VETERINARY MEDICAL ASSOCIATION—The address of Dr. Nelson S. Mayo, secretary of the A. V. M. A., is 4753 Ravenswood avenue, Chicago, Ill.

ARMY VETERINARY DEPARTMENT.

IF THERE WERE TO BE WAR WITH MEXICO WHERE WOULD WE GET THE HORSES?

The *Army and Navy Journal* is exercised over the dearth of horses in the United States at present, of a kind to satisfy the specifications of the Quartermaster Corps of the War Department, which, it states, cannot be had in sufficient numbers for the present peace army. In the event of war with Mexico, sooner or later, that newspaper is wondering where the mounts for the cavalry are to come from. We here reproduce the whole of the note from the August 2d *Army and Navy Journal*; also we add the leading article from the August 9th number of the same journal:

“If the United States army is sent into Mexico, it will be necessary to supply it with horses from the United States. After investigation of conditions in Mexico it has been found that there is no available supply of horses in the country, as practically all the good animals have been used by the Mexican federal government and the various revolutionary parties. As a consequence, the minute that the United States Government decides to intervene, the Quartermaster Corps will be in the market for a large supply of mounts. It will require three months’ training and treatment to put the horses in condition to send them to Mexico. It has been the experience of the War Department that about twenty or thirty per cent. of the horses purchased in the open market are incapacitated by train-sickness. After they are gathered together at a central point, all of them must be put under the care of veterinarians and treated. Recently forty out of one hundred and eighty horses, purchased for the Winchester camp, were taken with train-sickness, and it will be a month or two before they are ready for service. The Department of Agriculture has an excellent treatment, which has reduced the deaths to a minimum, but no preventive of train-sickness has yet been discovered.” (*Note*—Notice the army veterinarian is not given any credit for his good work along this line.)

PROSPECTS OF A HORSELESS ERA.

"If enthusiasm could assure a victory, there is little doubt that the officers of the Mounted Service School at Fort Riley would win at the Berlin Olympic games of 1916, and it is unpleasant not to be able to share the high optimism with which Capt. Ben Lear, Jr., 15th United States Cavalry, writes in the *Rasp*, reviewed in our issue of August 2d, of the prospects in 1916; but, in all frankness, we may say that the rainbow which Captain Lear seems to see with all its colors gives only a very faint tinge of color as we view the sky of hope.

"It would be in the highest degree gratifying if the Mounted School could make a clean sweep at Berlin. Nothing would do more to give that school a high plane in the esteem of the American people than an overwhelming success in 1916, but the supply of horses from which we have to draw such winners does not seem large enough to insure gratification of Captain Lear's hopes. We recall the book published a little more than a year ago by Spencer Borden, of Fall River, Mass., on the scarcity of cavalry horses. This very instructive book, all the more worth while because of the disinclination of the author to avoid unpleasant comparisons, was summarized in the *Army and Navy Journal* of April 27, 1912, page 1071. The keynote of this book is to be found in its statement that 'if this country were to become involved with any other power at the present time the army of the United States would not know where to find the horses for its mounted service, no matter what it would be willing to pay.' The drift of the times in the matters of transportation is away from the development of horses. Until the invention of the railway the horse was practically the sole means of transportation from city to city and from country to country. With the introduction of the steam vehicle the use of the horse was lessened, but as steam car was restricted to a particular metal roadway the horse still had a large vogue for short distances where railroads were not operative.

"Up to the time of the bicycle the horse was the means of obtaining the most rapid transportation away from a railway track, but the bicycle soon had the horse beaten, and upon the heels of that came the automobile, *which can practically go wherever the horse can go and many times faster*. The decreased interest in the horse may be seen in the attitude of the public towered lowered records in trotting and running. In the days of Flora Temple, Dexter, Goldsmith Maid and other fast trotters, interest in their achievements ran high, for a reduction in the

time for covering a mile might mean a development of speed generally for the carrying of people about the country. So when a running horse like Longfellow or Harry Bassett in the famous days of the early turf history of this country lowered the record, it was held to mean just so much of a step forward in the means of transportation; but now, when the automobile dashes over country roads with the speed of the fastest locomotive, it is difficult to arouse much popular enthusiasm in the cutting of a horse record by a second or so, for its practical value is virtually nil as compared with what it meant fifty years ago. In those times every little town had its livery stable. Now the livery stables are being turned into garages for automobiles, and livery horses are becoming fewer and fewer. The improvement of roads throughout the country is being pushed with an eye to comfort of the automobilists, not the horsemen. On the top of all this has come the aeroplane to promise still more surprises in transportation and a still further reduction in the practical value of the horse. All this lessening of interest in man's best friend as the primary means of transportation must be reflected ultimately in the supply available for cavalry, although it may be possible that government aid may offset in some measure the depreciating influences of other means of transportation and furnish to the army, horses of the first-rate quality, but that this aid must be very liberal and continuous no one will doubt who has given the subject much close attention."

Is it true that the automobile can go practically everywhere a horse can go and a good deal faster? In the event of war with Mexico the automobile would cut a poor figure trying to caper through the jungle and morass and over the rough mountain roads of that wild country. This statement must be taken *cum grano salis*—with a grain of salt. The editor of the *Army and Navy Journal* is trying to shiver the timbers of hope in which Captain Ben Lear, he believes, is imaginatively sailing.

Apparently these two articles do not harmonize. In reality they are meant to be pitched in the same key. The *Army and Navy Journal*, which is the authoritative newspaper of the two services, as much as the *Gazette* is the authoritative newspaper of the British army, knows very well that one of the most trying things in the army is the problem, and a very grievous one it is, of how to get horses of sufficiently high grade, in sufficient numbers, to carry on the work of the cavalry. Every one who has any information on this subject knows that the Quartermaster Corps is working with the Bureau of Animal Industry, our

“national veterinary bureau,” as it has been called, in an attempt to popularize anew the breeding of horses of a type suitable for the army and to make it profitable as well as a business. The army hardly gets enough horses of a satisfactory kind to mount its few cavalry regiments on a peace footing, and the statements made by the officials concerned in the work of improving the breeding and increasing the supply go to show that the time has come when the problem—how to get horses of any character in time of war—would be a most vexatious one.

There is no doubt that the problem at bottom is mercantile, agricultural and military. The digest of present-day conditions and new-fangled means of locomotion is correctly put. Means of motility are different now from what they were a few years ago when “man’s best friend” was nearly the only means of transportation. That is the mercantile phase of the problem. Again, farmers have gotten out of the way of breeding saddlers, largely for the reason that there was no call for them and no profit in them—that is the agricultural phase of the problem. Besides, military people only wanted a few saddlers each year and they were but a small part of the sum of the original buyers in the heyday of the saddle and carriage horse. Instead of tending to increase its sales, the army preferred to hammer down prices, keep to as low a point as possible the number of mounts purchased, and, worst of all, peace year after year prevailed in the land so that there was no chance of the army swelling in size, either suddenly or gradually. Hence the cry which the *Army and Navy Journal* has raised: “If we go to Mexico, where are we to get the horses?” This is the military phase of the subject.

To our mind two points stand out very conspicuously in view of the interrogatories of the *Army and Navy Journal*. The first is that the horse is in the army to stay. It is just as absurd to think that we can have cavalrymen without horses as to think we can have horses without cavalrymen. The *Army and Navy Journal* knows this better than we do and voices it when it says: “The minute that the United States Government decides to intervene, the Quartermaster Corps will be in the market for a large supply of mounts.” The cavalry arm of the service is an integral part, and in tactics that arm in most cases has its distinct part to perform. Etymologically a cavalryman is a horseman. A cavalryman cannot be mounted on a motorcycle, a bicycle, a diminutive automobile, or any gasoline-run machine. His place is on a horse. What is the use of talking differently? Every military person knows that a military machine—an army—

working in Mexico or any embattling country, through roadless regions, must have horses and must have horsemen. The horse and the rider—the cavalryman—is a permanent part of the army. That is the first point.

And the second point is like unto it. The editor of the *Army and Navy Journal*, like many another writer, speaks of the horse as "man's best friend." That is a pretty piece of sentiment which has the virtue of being true. But just as it is true that throughout all civilized ages, in all civilized warfare, it has been found true that the horse is the military man's best friend, so it is also true that the best friend the horse has is the veterinarian. The two, the cavalry horse and the modern army veterinarian, are inseparable—as much so as David and Jonathan or Damon and Pythias. If the horse is a permanent element in the army, as the *Army and Navy Journal* must admit, so also the veterinarian must be a permanent element in the army. With the improvement of the army horse should go the improvement of the army veterinarian. With the increase in number of army horses in case of war with Mexico or any other country, must come the increase in number of army veterinarians. If there are to be improvements in the cavalry arm of the service there should also be an improvement of the efficiency of the best friend of the army horse. If the army horse is to be increasingly more valuable; if he is to be better bred, better trained, better cared for, the professional men who are placed in the army to make him give better service should surely be rewarded. The army cannot separate itself from either—from the military man's best friend or from the best friend of this dumb servitor. Let the army look to it that both are taken at their full value.

D. ARTHUR HUGHES,
Veterinarian, Quartermaster Corps.

HOG CHOLERA AND ITS PREVENTION is the title of *Bulletin* 57, College Station, Texas, by R. P. Marsteller, Associate Professor of Veterinary Science, and is very interesting and instructive; covering the use and method of administering serum, dosage, control and eradication of an outbreak of hog cholera, forms of syringes, etc., etc.

[*Erratum.*] In President Marshall's notice in regard to the meeting of the International Veterinary Congress in London, on page 74 of the October issue, with the recent A. V. M. A. meeting in mind, he announced the *Fiftieth* instead of *Tenth* Veterinary Congress.

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.*

REPORT OF COMMITTEE ON RESOLUTIONS.

Whereas, The control of hog cholera is of the greatest importance to the hog-raising industry of the country, therefore be it

Resolved, That the Committee on Diseases be requested to investigate and present a special report at the next meeting of the Association, on the control and eradication of hog cholera.

Whereas, The published average normal temperatures of the domesticated animals as well as wild animals in confinement, are conflicting and lack uniformity, be it

Resolved, That a request be made to the Federal Bureau of Animal Industry to furnish this Association, at its next meeting, statistics on the normal temperatures of the different domestic animals which come within the scope of their work.

Resolved, That this Association endorse the recommendations of the New York Milk Commission as published by the United States Public Health Service, Volume XXVIII., No. 34, August 22, 1913, with the exception that we do not consider it advisable at this time to recognize any particular score card.

Whereas, The veterinary profession has been assailed and criticized because of some of its members having falsified tuberculin and mallein test-charts, and others issuing certificates for emigrant shipments that were not in conformity with the laws or regulations of the state or province to which such shipment, or shipments, was destined, thereby causing the shipper more

* Space would not permit of the publication of the report of the Committee on Resolutions in the October number; all of which were passed by a vote of the association at the fiftieth anniversary meeting in New York, September, 1913.

or less inconvenience and expense and casting reflection upon the profession as a whole, therefore be it

Resolved, That this Association condemn such action; and be it further

Resolved, That this Association urge that each state or province that has not already done so, enact, at an early date, legislation forbidding the falsifying of any tuberculin or mallein test-chart, or issuing a certificate upon the health of any live-stock shipment, that does not conform to the law of the state or province to which such shipment is destined; and be it further

Resolved, That a copy of this resolution be sent to the governor and live stock sanitary board, or commission, of each state and province of North America.

Resolved, That the recommendations contained in the attached Memorial from the United States Live Stock Sanitary Association, through its Secretary, Prof. J. J. Ferguson, be endorsed by this Association.

MEMORIAL.

To the Members of the American Veterinary Medical Association in Convention Assembled:

GENTLEMEN—As the result of much study and observation in connection with the slaughter of large numbers of hogs at packing houses under United States Government inspection, we deem the following observations of timely importance to the members of your Association and of even greater interest to the farmers and stockmen whom you serve:

We recognize the Niles-Dorset Serum for the treatment of hog cholera as the most valuable agent now employed for this purpose. We recognize that in the hands of competent veterinarians, this serum may be safely administered and prove of great value. We also believe that in the hands of the average farmer and unskilled operator, the use of this serum may cause serious damage to portions of hog carcasses. We believe that improper serum, the use of dirty syringes, accompanied by general unsanitary conditions after treatment, will result in serious damage.

As the proper area for inoculation is still an open question, we wish to suggest that some place other than the ham be properly designated as suitable for the purpose. There is a probability of ham inoculation causing abscesses not discoverable until the ham is sliced for use.

So serious has the situation become that one packing firm has undertaken a series of comparative experiments, in which groups of live hogs are being vaccinated in the neck, shoulder, flank and ham. These groups will be kept separate, slaughtered separately and injury to the carcasses carefully compared by United States Government Inspectors.

We wish to bring this matter strongly before the attention of the American Veterinary Medical Association, with a recommendation that the matter be investigated, and, if possible, some action taken to check this preventible damage.

In our opinion serum should be used only by competent practicing veterinarians. The use of serum by farmers and incompetent laymen should be discouraged as far as possible.

Respectfully yours,
(Signed) J. J. FERGUSON.

Resolved, That this Association desires to express its sincerest thanks to the distinguished gentlemen who were our guests on this occasion, and added so much to our pleasure and entertainment.

Whereas, The success of our annual meetings is, in a large measure, dependent upon the labors of the local Committees on Arrangement and Entertainment; and

Whereas, The splendid success of our Fiftieth Anniversary Meeting reflects the greatest credit upon the members of the local committees, including the ladies; therefore be it

Resolved, That the best thanks of this Association be tendered to each and all of those who have in any way contributed locally or otherwise to the magnificent success of this meeting; and be it further

Resolved, That the Association desires to extend its thanks to all those who have aided in the literary success of our programme.

Respectfully submitted,

W. H. DALRYMPLE, Chairman;
E. H. SHEPARD,
G. A. JOHNSON,
S. H. WARD,
G. B. MCKILLIP.

Resolved, That the European Study Tour for Veterinarians, planned by Dr. A. Eichhorn for American veterinarians in con-

nection with their attendance at the International Veterinary Congress, be endorsed by this Association and that members be recommended to make this tour if practicable for the purpose of study and improvement.

(Signed) D. M. CAMPBELL.

Whereas, It is the constant purpose of the American Veterinary Medical Association to imbue its members with the highest ideals of professional progress; and

Whereas, In pursuance of this policy it desires, wherever the achievements of its members merit it, to commend and give impetus to any measure devised for the furtherance of efficiency of veterinary medicine; and

Whereas, The agricultural departments of the Federal Government and of the several states of the South have, through their cordial and effective co-operation, made notable progress in the eradication of the cattle tick (*Margaropus annulatus*); and

Whereas, The eradication of the cattle tick from the Southern States of America is of national importance, involving the development of the cattle industry of more than seven hundred thousand square miles of territory; and

Whereas, The area now quarantined because of the tick, when free, will produce thirty millions more cattle, worth nearly one billion dollars; and

Whereas, The early termination of this work requires the discontinuance of the practice of shipping cattle infested with ticks from the quarantine area to free market points for immediate slaughter; and

Whereas, It is the judgment of this Association that splenic fever or "tick fever" should be subjected to the same restraints as is tuberculosis, glanders, hog cholera and other contagious, infectious and communicable diseases; therefore be it

Resolved, That the Association congratulates Drs. Curtice, Butler, Mohler, Dalrymple, and all others who have participated in the stupendous sanitary work thus far accomplished through tick eradication; and be it further

Resolved, That this Association record itself in favor of an amendment to the Act of Congress dated 1884, which will prevent the interstate movement of cattle for any purpose whatsoever, when infested with cattle ticks; and be it further

Resolved, That a copy of these resolutions be forwarded to the Honorable Secretary of Agriculture of the Federal Govern-

ment and to the Federal Government and to the Governors of the several Southern States and to the Chairman of the Committee on Agriculture of each House of Congress.

W. H. DALRYMPLE, Chairman.

COMMITTEES APPOINTED BY PRESIDENT MARSHALL FOR
1913-1914.

GENERAL COMMITTEES.

Executive.

	C. A. Cary, Chairman	
Lester H. Howard		H. Jensen
O. E. Dyson		G. H. Roberts
	S. H. Ward	

Intelligence and Education.

	C. H. Stange, Chairman	
John F. DeVine		A. H. Baker
W. B. Craig		Pierre A. Fish

Diseases.

	V. A. Moore, Chairman	
W. W. Dimock		C. M. Haring
S. H. Gilliland		A. T. Kinsley

Legislation.

	W. Horace Hoskins, Chairman	
James Robertson		John P. Turner
F. A. Bolser		W. G. Hollingworth

Finance.

	James T. Glennon, Chairman	
A. S. Cooley		Charles R. Jolly

Publication.

	John R. Mohler, Chairman	
J. H. Blattenberg		Ward Giltner
R. W. Ellis		N. S. Mayo

Necrology.

	W. Herbert Lowe, Chairman	
George H. Berns		A. Bostrom
Orville L. Boor		S. Brenton

Resolutions.

	A. D. Melvin, Chairman	
G. A. Johnston		E. H. Shepard
G. B. McKillip		J. G. Wills

SPECIAL COMMITTEES.

International Tuberculosis Commission.

J. G. Rutherford, Chairman

Veranus A. Moore	J. W. Flavelle
John R. Hurty	W. D. Hoard
John R. Mohler	W. C. Edwards
J. J. Ferguson	Frederick Torrance
E. C. Schroeder	C. A. Hodgetts
T. W. Tomlinson	Mazyck P. Revenel
M. H. Reynolds, Secretary	

Revision of Veterinary Anatomical Nomenclature.

S. Sisson, Chairman

I. E. Newsom	S. L. Stewart
--------------	---------------

Veterinary College Investigation.

M. H. Reynolds, Chairman

George W. Dunphy	P. H. Browning
------------------	----------------

Agricultural College Investigation.

A. M. Farrington, Chairman

Paul Fischer	James B. Paige
--------------	----------------

Advertisements of Veterinary Remedies.

George H. Glover, Chairman

Joseph Hughes	R. P. Lyman
---------------	-------------

Investigation of Glanders.

E. B. Ackerman, Chairman

Adolph Eichhorn	Charles E. Cotton
Charles Keane	C. D. McGilvray
John Reichel	

Reorganization of Association.

H. D. Gill, Chairman

D. M. Campbell	George H. Hart
T. E. Maloney	D. E. Salmon

Resident Secretaries.

Alabama—I. S. McAdory, Auburn.
 Arizona—J. C. Norton, Phoenix.
 Arkansas—J. F. Stanford, Fayetteville.
 California—David F. Fox, Sacramento.
 Colorado—Charles G. Lamb, Denver.
 Connecticut—G. W. Loveland, Torrington.
 Delaware—H. P. Eves, Wilmington.
 District of Columbia—R. W. Hickman, Washington.
 Florida—Fred W. Porter, Tampa.
 Georgia—William M. Burson, Athens.
 Hawaii—Victor A. Norgaard, Honolulu.
 Idaho—G. E. Noble, Boise.
 Illinois—H. D. Paxson, Chicago.
 Indiana—J. W. Klotz, Noblesville.
 Iowa—J. I. Gibson, Des Moines.
 Kansas—K. W. Stouder, Manhattan.

Kentucky—L. M. Land, Lexington.
Louisiana—F. J. Cambon, New Orleans.
Maine—A. Joly, Waterville.
Maryland—F. H. Mackie, Baltimore.
Massachusetts—Francis Abele, Jr., Quincy.
Michigan—James J. Joy, Detroit.
Minnesota—G. E. Leech, Winona.
Mississippi—E. M. Ranck, Agricultural College.
Missouri—F. F. Brown, Kansas City.
Montana—A. H. Cheney, Miles City.
Nebraska—Paul Juckniess, South Omaha.
Nevada—W. B. Mack, Reno.
New Hampshire—G. E. Chesley, Rochester.
New Jersey—J. Payne Lowe, Passaic.
New Mexico—Marion Imes, Albuquerque.
New York—C. D. Pearce, Buffalo.
North Carolina—A. S. Wheeler, Baltimore.
North Dakota—W. F. Crewe, Devils Lake.
Ohio—J. D. Fair, Millersburg.
Oklahoma—Charles H. Jewell, Fort Sill.
Oregon—W. Dean Wright, Portland.
Pennsylvania—F. H. Schneider, Philadelphia.
Philippine Islands—A. R. Ward, Manila.
Porto Rico—Carlos Ortiz, Ponce.
Rhode Island—John S. Pollard, Providence.
South Carolina—B. Kater McInnes, Charleston.
South Dakota—Stanley W. Allen, Watertown.
Tennessee—John A. Kiernan, Nashville.
Texas—R. P. Marsteller, College Station.
Utah—H. J. Frederick, Logan.
Vermont—F. A. Rich, Burlington.
Virginia—George C. Faville, North Emporia.
Washington—J. T. Seeley, Seattle.
West Virginia—L. N. Reefer, Wheeling.
Wisconsin—W. G. Clark, Marinette.
Wyoming—Otto L. Prien, Laramie.

Australia.

Australia—J. Desmond, Adelaide, New South Wales.

South America.

Brazil—John H. McNeil, Sao Paulo.

Canada.

Alberta—Edward A. Watson, Lethbridge.
British Columbia—Seymour Hadwen, Agassiz.
Manitoba—R. D. Macintosh, Winnipeg.
New Brunswick—D. McCuaig, McAdam Junction.
Nova Scotia—William Jakeman, Glace Bay.
Ontario—D. McAlpine, Brockville.
Prince Edward Island—W. H. Pethick, Charlottetown.
Quebec—A. A. Etienne, Montreal.
Saskatchewan—D. S. Tamblyn, Regina.

NEW YORK STATE VETERINARY MEDICAL SOCIETY.

The above society held its annual meeting on board the steamer *Rosedale* while cruising in the waters of the Hudson River and New York Bay September 4, 1913. After a business session, reading of secretary's report and admission of new members, the president, Dr. David W. Cochran, read the annual presidential address.

PRESIDENT COCHRAN'S ADDRESS.

GENTLEMEN—In keeping with the time-honored custom of this society, we are gathered here to-day to strike a trial balance of our activities during the past year. But before I proceed further I wish to thank you, one and all, for the support I have had during my term of office. It is the purpose of every man's life to do something worthy of the recognition and appreciation of his fellow man. There is no accomplishment of mine of sufficient importance to have accorded me the honor which you have conferred on me in electing me President of the New York State Veterinary Medical Society. For your generosity in thus honoring me, I am most grateful. The span of man's activity is so short that many who are most worthy cannot receive the honor. That you should have conferred it on me affects me profoundly. In return for your confidence it has been my pleasure to give my best energy, thought and judgment to the welfare of this society. Good fellowship is an asset. It is an educator. I am grateful to all—each and every one—and gratitude with me is the fairest flower that sheds its perfume in the human heart. The wisest of ancients declared that a man was rich beyond the dreams of avarice if he could count, in fortune and misfortune, his true friends on the fingers of one hand. You are all my friends. I know whereof I speak, for I have tested your friendship many times, in sunshine and in storm. According to the wisdom of the old philosopher, I am indeed rich—not in dollars, but something better, something dollars cannot buy—true, sincere friends, with whom I have been acquainted for a long time. My life has been a simple one, an earnest one. I believe the secret of all success is hard work, loyalty to friends and fidelity to my profession.

Twenty-four years ago there was held a conference of a number of veterinarians. For the time being they buried their prejudices and fears of one another. They discovered that when

men come together and look into each others' faces and laugh and joke, they become closely bound together by ties of friendship; that when men are in the same business, there is that which they hold in common that makes for respect and confidence; and especially, that after intimate association they cannot be guilty of any lies or misrepresentations or defamations concerning their associates.

A convention such as this has many pleasant associations and beneficial influences. It cultivates a spirit of fraternity and good fellowship. We come together to consider matters affecting the welfare and progress of our profession. This association has been a strong factor in bringing together the best element of the veterinary profession. The papers, reports of cases and discussions at these meetings have been instructive and of scientific and practical value. Should our ideas not meet with approval and our will be defeated, let us accept the result cheerfully as the will of the majority, and try again. Remember that the age in which we live is one of organization. No longer do men attempt to stand alone when seeking to accomplish the best results, or to protect themselves against persistent wrongdoers; but by combining forces, become a power for good. If, therefore, we hope to perpetuate the noble efforts of our society, we must submerge all differences, unite our forces and work for the common welfare of all. One may argue that it matters very little whether he adds his strength to the organization or not, it will go along just the same. But let us remember the lesson given by the wise father to his sons. The bundle of sticks, bound together, resists all efforts to break them. Disjoined and disunited, they may be broken one by one with the greatest ease. Thus it is with us; joined together by the indissoluble ties of brotherhood and common interests, we are indestructible. Separate and apart, we may be broken on the rock of prejudice and the results of our labors dissipated. Let those who are wavering take the lesson well to heart and cast their lot with those who are working for the glory and perpetuation of our profession.

The uneducated empiric has been driven out to a great extent to make way for the veterinarian who is educated in our up-to-date institutions. Charlatanry seems to be an immortal fungus which clings to every phase of civilization and to no phase more tenaciously than to that which embraces the physical ills of our patients. Though no doubt honest art will prevail in the end, yet the competition of the charlatan makes itself felt and will continue to do so until the public realizes how uneconomic it is

to fool with disease. The increasing number and value of live stock demands of us and offers due reward to us for higher knowledge and skill in the treatment of their diseases. The veterinary profession can do a great public good by giving information as to the diseases of animals. Ignorance and erroneous views often exist, and the danger of contagious diseases is not generally understood by many people with whom we come in daily contact.

The different veterinary bureaus are equipped with able veterinarians who are competent to handle the problems which they meet in their daily routine work. The veterinarian should be practical, not too theoretical. He should endeavor to adapt scientific theory to practical conditions. I would caution those who are acting in an official capacity to be reasonable in their advice, not too authoritative, so as not to create any antagonism or irritation on the part of the stock owners or keepers of live stock. We should endeavor to obtain their co-operation.

The veterinarian of the present time occupies an important position as guardian of the health of the public. It is a well-known fact that meat and milk are sold in our large cities that are unfit for human food, that endanger the health and even the life of the consumer. The veterinarian can render valuable service by condemning for consumption unhealthy animal food, as well as preventing the transmission of animal diseases to man, and controlling and extirpating contagious diseases of animals.

The training given by our colleges is of the highest value for young men who choose the veterinary profession. The most successful are those who have a love for animals and have had experience in handling live stock. Advancement is retarded by the failure of the individual to utilize time and avail himself of opportunity. The demand of the times is that we level every opposition and make smooth the way of general progress, enlightenment, education and the higher ethical obligations. Competency is attained and maintained only by indefatigable labor and continued effort in self-education. The responsibilities of the veterinarian rests upon his own individual self for his position, and to a limited, but positive degree, for that of his fellow practitioners. If he shrinks from its weight, the burden becomes doubly heavy. If he "short cuts" for success, he sinks into the mire of dishonesty and dishonor. If he carries the weight with an erect figure, abiding integrity and a strong heart, it rides like a bubble. When given a diploma, we are all supposed to be equal. But no insignia makes men equal in veterinary

medicine any more than in other lines of human endeavor. Every individual has a personality of his own. By his superior intellectual qualifications, his fidelity of purpose, and, above all, his indefatigable labor, he may become a leader. He who keeps above the standard desires companionship. Therefore if we elevate the ethical and educational average, we enhance the percentage of efficiency to the public and increase the brotherhood of the profession. The ideal of practice must be the stimulation of individual exertion to the highest degree and the establishment of a standard, the attainment of which should be the great desire of every member of our society, each to assist the other in his upward progress. The vast majority of veterinarians are men of high integrity and are a credit to the profession. In every profession, however, some unworthy members are to be found. Ours is no exception.

The successful veterinarian is a deep thinker, an investigator. Our patients cannot tell us their sensations, nor history of any injuries. We must know from clinical experience to become experts in the art of interpreting the different forms the patient assumes: note the characteristic gait, any alteration in the function of respiration as characterized by an increased dilation of the nostrils; peculiar forms of coughing; accelerated motion in the region of the flanks; any changes in the circulation as indicated by the pulse; the appearance of the mucous membranes; the condition of the nerve centres by the more or less diminution of strength of the animal; the febrile condition by the registered heat of the thermometer; as well as the slightest departure from any normal condition. It is an art of close observation. While we of the present day owe much to the bacteriologist in clearing up some of the latent forms of disease, still the bacteriologist has to depend on the clinician to discover first the various pathological lesions. The relations between the clinician and biologist must be reciprocal. The former has spent centuries in acquiring knowledge which the latter is perfecting. The latter is working out exact methods, whose application must in the future perfect the work of the former. Neither can satisfactorily perform the work of the other; neither can do the work of both for the fields are too large.

War has had its heroes and its victories. Slowly and surely they are fading into the region of the legend and of history. But the courage and strength, the nobility and gallantry that the race has evolved through centuries of struggle, have been turned toward another goal—more useful to mankind. Those of the army of thinkers are truly the soldiers of their country. They

who stand, hour after hour, over their test tubes in the laboratory are the modern heroes, the leaders and the warriors of to-day in their effort to further advance human knowledge beyond which lie the clouds of mystery encircling our little corner of the universe. Investigation becomes synonymous with painstaking, inquisitive, unwearying, intellectual toil. We have here with us men of tried calibre, whose education and the effort which they are putting forth are national property.

We are members of a great profession, left to us in all its beauty and dignity as the result of the self-sacrificing efforts and loyalty of those who have gone before. We have received this priceless heritage, and it is ours to pass on unsullied and untarnished to our successors. Our predecessors built the foundation. Let us add our mite to the building of a glorious and perfected superstructure. Well has the poet sung:

Not gold, but only men can make
A nation great and strong,
Men who for truth and justice' sake
Stand fast and suffer long,
Brave men who work while others sleep,
Who stand when others fly—
They plant the nation's pillars deep
And raise them to the sky.

Scientific Progress—While there has been no epoch-making discovery since our last meeting, great practical advancement has been made. The different *modus operandi* for the diagnosis of glanders have greatly advanced, though they have not been entirely mastered. The efficiency of the tubercular testing in cattle has been thoroughly demonstrated by positive post-mortem examinations. The immunizing of hogs with serum for hog cholera has proven very effective.

Immunity from Disease—As far as the treatment of disease is concerned, I think drugs will be given more, but also more wisely; or rather, what we administer will be increasingly in sera-therapy or chemo-therapy to confer immunity from disease. But our great aim will be in the direction of hygiene, the science of preserving health, the science of curing disease, for hygiene is the finest jewel in the medical crown. The name of every prominent man in medicine has been associated with some achievement in connection with the prevention of disease as well as its cure. Remember it is easier to preserve the health of animals than it is to restore it when lost.

I am in favor of abolishing the public watering trough. I do not think there is any debate, but this is one of the possibilities of spreading glanders. I would also recommend public abattoirs that would be under competent veterinary inspection. In this way, meat which would be dangerous to health would be condemned and the owner could receive a part indemnity.

I want especially, gentlemen, to call your attention to one fact which I think a great many members have overlooked—that is the conference which is held at Ithaca each year. It should receive the earnest co-operation of every veterinarian in this state. I can assure you, from personal experience, that it is time and money well spent. It has not been appreciated by the veterinarians of the state as it should be. The endeavor put forth, and the energy expended by the men who originated the idea of this conference, should be more appreciated than it has been. I consider it one of the most interesting meetings of veterinarians I have the pleasure to attend. The clinics are most attractive, instructive, and inspiring, and I consider them the best means of advancing, co-ordinating and standardizing medical innovation. We have a striking example of the enthusiasm, appreciation and desire for these meetings by the ever-increasing attendance of busy practitioners. Men are inspired by seeing others in action rather than by reading or hearing about them. The clinics are all diseases of the everyday type, accentuating the most recent advancement in diagnoses and treatment. These clinics increase the interest and enhance the educational value of these conferences.

In the State of New York there are seven veterinary societies (one I have just alluded to). The work accomplished at the conventions of these societies is of great educational value, for here are brought together men with one desire uppermost in their minds—the elevation of the veterinary profession. The papers read at these meetings with the discussions ensuing, the observations and experiences of members, the interchange of ideas, the successes and failures met with in practice, all these things come as the result of organization, and tend to uplift the profession and enhance the veterinarian's proficiency. One of the greatest benefits to our profession is the work done by a special committee, appointed in the societies, in exterminating from the field of practice illegal practitioners. Their untiring labor, the sacrifice of their time and expense, and the results obtained by them, cannot but be appreciated by all who have at heart the uplift of the profession. Certainly these men should receive the support and credit due to their indefatigable labors.

We have two veterinary colleges in the State of New York, both under government support. The entrance requirements of these institutions are such that graduates from them will be the standards of the country. When all states or colleges in the United States have adopted a uniform college entrance examination, then a graduate from a college in one state of the Union will be on an equal footing with a graduate from any other state. Then, and only then, can we have an interstate license; a man who has passed the state examination in one place would be eligible to practice in any other provided the standards of examination would be equal to those of New York State.

The twenty-fourth annual meeting of the New York State Veterinary Medical Society will be a meeting only in name, and the business conducted will be only routine work. While the individuality and pleasure and educational advantages of our meeting have been absorbed by the convention of the fiftieth annual celebration of the American Veterinary Medical Association in our state, it was deemed imprudent to hold two large meetings in the state close to each other, for the expense and time lost to the members would be considerable. Precedence was given to the A. V. M. A. The majority of the members sanctioned that we gracefully and cheerfully unite with the A. V. M. A. to celebrate the great event in veterinary history. It is to be hoped that next year, when this society holds its twenty-fifth annual meeting, the celebration of that august event will be of as much importance as the present meeting of the A. V. M. A. What the one will lack in number, will be made up in enthusiastic show of dash and spirit, which is a complementary part of every gathering of veterinarians.

Dr. Cochran's address was followed by the election of officers for 1914, making Dr. W. B. Switzer, of Oswego, its chief executive, and continuing Dr. H. J. Milks, of Ithaca, as secretary. The meeting then adjourned, to meet in Rochester in 1914 to celebrate its silver anniversary in the city in which it was organized in 1889.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the M. V. M. A. was called to order by the president, Dr. Jervis, at Waterville, October 8, 1913.

The following responded to the roll-call: Drs. L. S. Cleaves, W. H. Corey, C. F. Dwinal, H. N. Eames, F. W. Huntington,

G. R. Inglis, H. B. F. Jervis, A. Joly, W. H. Lynch, C. H. McGillicuddy, C. W. Purcell, E. E. Russell, F. L. Russell, I. L. Salley, C. L. Ryan, H. L. Stevens, W. H. Robinson, G. F. Wescott, H. B. Wescott, W. L. West.

Dr. D. B. Fitzpatrick, of Philadelphia, Pa., and Dr. Carl F. Davis, of Rumford Falls, Me., were welcome visitors.

The minutes of the July meeting were read and accepted.

Dr. W. L. West read Dr. C. L. Blakely's paper on "A Peculiar Case in a Horse." The paper described the symptoms found and the treatment used, and was discussed very freely. A letter from Dr. Blakely was read, explaining why he was unable to be present and read his own paper.

Dr. H. N. Eames read a paper on "Contagious Abortion," which brought forth a very interesting and heated discussion.

Dr. Jervis next introduced Dr. D. B. Fitzpatrick, Deputy State Veterinarian of Pennsylvania, as the speaker of the evening. Dr. Fitzpatrick's address was on "The Production of Wholesome Milk." He outlined the laws in force in Pennsylvania in regard to the milk supply and its inspection. He illustrated his address by the use of slides and a lantern, which proved to be very interesting and instructive. At the conclusion of his address the association extended him a rising vote of thanks.

A vote of thanks was extended to the Waterville city government for the courtesy shown the association by extending the use of the aldermanic chambers for the meeting.

The following members reported as attending the A. V. M. A.: Drs. W. L. Mebane, A. Joly, G. F. Wescott, A. L. Murch, W. H. Robinson, W. H. Lynch. Dr. Lynch read a report of the meeting of the Boards of Examiners of the several states.

The committee on the revision of the schedule of fees asked to have more time to prepare their report and will present the same at the January meeting.

The application of Dr. Carl F. Davis, of Rumford Falls, Me., was acted favorably upon by the executive committee, and he was then elected to membership.

The secretary reported the receipt of the annual reports of the proceedings of the Pennsylvania and Indiana State Veterinary Medical Associations.

Dr. Herbert F. Palmer, of Philadelphia; Dr. D. B. Fitzpatrick, of Philadelphia, and Dr. Wm. M. Simpson, of Malden, Mass., were elected honorary members of the association.

It was voted to hold the annual meeting in Portland, January 14, 1914. It was also voted to give the ladies a banquet, and the president appointed the Portland members on this committee

to make arrangements for the banquet and the entertainment for the ladies in the afternoon. The meeting will be called at 3 p. m., and the banquet will be held at 7 p. m.

Banquet committee: Dr. W. H. Robinson, chairman; Drs. W. H. Spear, F. W. Huntington, W. H. Lynch, G. F. Wescott, H. B. Wescott.

Meeting adjourned at 12.45 a. m.

H. B. WESCOTT, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The first regular meeting of the 1913-1914 session of the K. V. M. A. was held September 9, 1913; President Yunker in the chair.

The meeting was opened with the calling of the roll, twenty-three members responding to their names; and as guests, Doctors Mumma, Gunner and Crocket were present.

The first essayist was Dr. Louis A. Klein, who read a very interesting paper on "Therapeutics of Mastitis in Cattle," in which he outlined the treatment advocated by various veterinarians, calling particular attention to the use of purgatives, potassium iodide and the use of biological products.

The next essayist was Dr. John Reichel, who read a paper on "Diagnosis of Glanders" which was similar to the report of the Glander's Commission of the American Veterinary Medical Association, of which he is a member. This report was received with the greatest interest and the Association voted its hearty approval of the same.

The reading of the papers was followed by the report of the delegates to American Veterinary Medical Association. Doctors F. H. Schneider and L. A. Klein spoke briefly, followed by a very entertaining description by Dr. W. H. Hoskins.

The applications of Doctors James B. Hardenberg, J. Julius Herbott and Charles MacAnulty were favorably recommended by the Board of Censors, and were elected to active membership.

The annual election of officers resulted as follows: Dr. Elkan H. Yunker, President; Dr. Mayhar W. Drake, Vice-President; Dr. Cheston M. Hoskins, Secretary and Treasurer; Board of Censors, Doctors W. H. Hoskins, C. J. Marshall, A. Ormiston, F. H. Schneider and J. Reichel.

There being no further business a motion to adjourn was made, seconded and passed.

CHESTON M. HOSKINS, Secretary.

NEWS AND ITEMS.

VETERINARIAN OLAF SCHWARZKOPF, THIRD CAVALRY, U. S. ARMY, has gone from Fort Sam Houston, San Antonio, Texas, to Fort Riley, Kansas, as instructor in the Mounted Service School.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION.—The Seventeenth Annual Meeting of the U. S. Live Stock Sanitary Association will be held in Chicago, at Hotel Sherman, December 2, 3 and 4, 1913.

THE TEXAS VETERINARY MEDICAL ASSOCIATION.—The semi-annual meeting of the Texas Veterinary Medical Association will be held at College Station November 18-19. Headquarters at the Veterinary building.

UTAH VETERINARY MEDICAL ASSOCIATION.—Through the courtesy of Secretary Coburn of the above association we received a report of the fourth annual meeting of this organization at Salt Lake City, on October 4, 1913. We regret its receipt too late for the November issue, but will take care of it in the next number.

OPENING EXERCISES, ONTARIO VETERINARY COLLEGE.—The opening exercises of the Ontario Veterinary College occurred on October 2, 1913. Addresses were delivered by the Venerable Archdeacon Cody, M.A., L.L.D., D.D., member of the Royal Commission of Higher Education in the Province of Ontario; and Robert A. Falconer, C.M.G., M.A., L.L.D., President, University of Toronto.

APPOINTED.—Dr. John T. E. Dinwoodie, of Bottineau, N. D., a graduate of the University of Pennsylvania Veterinary Department, has been added to the staff of the Veterinary Division of the College of Agriculture of the University of Minnesota. Dr. C. C. Palmer, of Pleasant Hill, Ohio, a graduate of the College of Veterinary Medicine of Ohio State University, has also been elected to a place in the same Division. He succeeds Dr. C. C. Lipp, who recently resigned to accept a professorship in the College of Agriculture of South Dakota, at Brookings.

NEW YORK UNIVERSITY DAY.—On October 17, all schools of New York University suspended sessions from 1 to 7 p. m. in order that all its students might assemble on the campus at University Heights, where the students from each school, with

their colors in the form of a band about the arm, met their respective deans, afterward greeted the Chancellor on the Library steps, and finally reported to their school marshals and formed a procession that walked about the beautiful grounds. The weather was ideal and the occasion a particularly enjoyable one.

ALPHA PSI NEWS: MARRIED.—St. Paul, Minn., October 14, 1913, Dr. Arnold A. Feist to Miss Victoria H. Taylor, of Philadelphia, Pa. Dr. Feist is a graduate of the Veterinary Department of the University of Pennsylvania, and was Resident Surgeon at the Veterinary Hospital, 1912-1913. Dr. Feist is a member of the Alpha Psi Fraternity and the American Veterinary Medical Association.

DIED.—August 7, 1913, Dr. Walter McHenry, of Waverly, Iowa. Dr. McHenry was a graduate of the Veterinary Department of the University of Pennsylvania, class of 1908. After graduation Dr. McHenry was appointed to the teaching staff of the New York State Veterinary College, at Cornell. More recently he was engaged in lecture work for the Bureau of Animal Industry at Washington. Dr. McHenry was a member of the Alpha Psi Fraternity and the American Veterinary Medical Association.

UNITED STATES CIVIL SERVICE EXAMINATION—VETERINARIAN (MALE).—The United States Civil Service Commission announces an open competitive examination for veterinarian, for men only, on December 3, 1913, to fill vacancies in the position of veterinary inspector in the Bureau of Animal Industry, Department of Agriculture, and vacancies in the Quartermaster Corps, at entrance salaries ranging from \$1,200 to \$1,400 per annum. Competitors will be examined in the following subjects, which will have the relative weights indicated: 1. Letter writing, 10; 2. Veterinary anatomy and physiology, 20; 3. Veterinary pathology and meat inspection, 30; 4. Theory and practice of veterinary medicine, 30; 5. Education, training and experience, 10; total, 100.

Graduation from an accredited veterinary college is a prerequisite for consideration for this position. Applicants must have reached their twenty-first birth-day on the date of the examination. This examination is open to all men who are citizens of or owe allegiance to the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply to the United States Civil Service Commission, Washington, D. C.

THE SOUTH AMERICAN MEAT INDUSTRY.—Under the above caption the Office of Information, U. S. Department of Agriculture presents to the public the findings of Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, who has recently returned from a tour of investigation, made by direction of the Secretary of Agriculture, through Argentina, Uruguay and Brazil. In Argentina he visited all the establishments preparing beef for export, except one, which was not in operation at the time. He also visited several large ranches, and attended the stock shows at Rosario and Palmero, where many fine animals were exhibited. In Uruguay he visited one of the two large establishments, the other not being in operation. In Brazil he visited Sao Paulo and Rio de Janeiro, where a fine municipal abattoir has recently been completed. From this point he went into the interior of the country. Argentina and Uruguay are large exporters of beef and mutton, for which Great Britain is their principal market. Brazil exports no refrigerated beef, although it supplies Central America and Cuba with a considerable quantity of cured beef, known as *taajyo* or *jerked beef*. Dr. Melvin was impressed with the great resources of that country for cattle raising, and believes it would be possible to largely increase the meat output. The doctor states that the cattle (for the most part high-grade stock, Durhams leading, Herefords ranking second and Polled Angus third), are raised and fattened entirely on alfalfa pastures, getting no grain whatever; these pastures supporting the cattle the year round. And yet, he says, alfalfa is not being grown nearly as extensively as it could be. Cattle that dressed 820 pounds were being sold for \$74.80 in gold; this being a very high-grade beef that sells in England for from 8 to 9 cents a pound wholesale. A very high grade of mutton is also produced in the Argentine; the best breeds of cattle and sheep having been imported there for years from Great Britain. Uruguay has a good grade of live stock, but they are not equal to the cattle in the alfalfa region of Argentina. Dr. Melvin reports that the federal governments of both Argentina and Uruguay, maintain veterinary inspection at all of the establishments exporting fresh beef; and that municipal abattoirs with official inspection are maintained very generally at all the South American cities of any importance. The cattle of Brazil are not of such good quality as those of Argentina and Uruguay; being largely mixed with the Zebu or East Indian cattle, a group of which were shown in the April, 1913, issue of the REVIEW on page 121, under "Tidings from Brazil."

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	June 6-7, 1913.....	Birmingham....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1914.....	141 W. 54th St..	P. K. Nichols, Port Richmond, N. Y.
American V. M. Ass'n.....	Dec., 28-31, 1914	New Orleans, La.	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n.....	January, 1914.....	Ft. Smith.....	J. B. Arthur, Russellville.
Ass'n Médécalle Veterinaire Française. "Laval".....	1st and 3d Thur. of each month.....	Lec. Room, La- val Un'y, Mon. Chicago.....	J. P. A. Houde, Montreal. H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	S. Omaha, Neb..	E. J. Jackson, So. Omaha.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	St. Joseph and vicinity	F. W. Caldwell, St. Joseph, Mo.
Buchanan Co. Vet. Ass'n.....	Monthly.....	San Francisco..	John F. McKenna, Fresno.
California State V. M. Ass'n.....	December 10, 1913..	Ottawa.....	A. E. James, Ottawa.
Central Canada V. Ass'n.....	Feb. and July.....	Syracuse.....	W. B. Switzer, Oswego.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Chicago.....	D. M. Campbell, Chicago.
Chicago Veterinary Society.....	2d Tues. each month.....	Ft. Collins.....	I. E. Newsom, Ft. Collins.
Colorado State V. M. Ass'n.....	May 28-29, 1913.....	Waterbury.....	B. K. Dow, Williamantic.
Connecticut V. M. Ass'n.....	August 6, 1913.....	Wilmington.....	A. S. Houchin, Newark, Del.
Delaware State Vet. Society.....	Jan., Apl., July, Oct..	Newark, N. J.....	J. F. Carey, East Orange, N. J.
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Rochester.....	J. H. Taylor, Henrietta.
Genesee Valley V. M. Ass'n.....	2d week, July, 1913..	Atlanta.....	P. F. Bahnsen, Americus.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Wash., D. C.....	A. T. Ayers.
V. M. A. of Geo. Wash. Un'y.....	2d Sat. each month.....	Chicago.....	Louis P. Cook, Cincinnati.
Hamilton Co. (Ohio) V. A.....	December, 1913.....	Indianapolis.....	L. A. Merillat, Chicago.
Illinois State V. M. Ass'n.....	Jan. 14, 1914.....	Pending.....	A. F. Nelson, Indianapolis.
Indiana Veterinary Association.....	Pending.....	Pending.....	C. H. Stange, Ames.
Iowa Veterinary Ass'n.....	Pending.....	Pending.....	J. H. Burt, Manhattan.
Kansas State V. M. Ass'n.....	Pending.....	Lexington.....	Robert Graham, Lexington.
Kentucky V. M. Ass'n.....	Oct. & Feb. each year.	Philadelphia.....	Cheston M. Hoskins.
Keystone V. M. Ass'n.....	2d Tues. each month.....	Pending.....	Phil. H. Fulstow, Norwalk, Ohio.
Lake Erie V. M. Association.....	Pending.....	Lake Charles.....	Hamlet Moore, New Orleans, La.
Louisiana State V. M. Ass'n.....	Sept., 1913.....	Portland.....	H. B. Wescott, Portland.
Maine Vet. Med. Ass'n.....	Jan. 14, 1914.....	Baltimore.....	H. H. Counselman, Sec'y.
Maryland State Vet. Society.....	4th Wed. each month.....	Young's, Boston.	J. H. Seale, Salem.
Massachusetts Vet. Ass'n.....	Feb. 3, 4, 1914.....	Lansing.....	W. A. Ewalt, Mt. Clemens.
Michigan State V. M. Ass'n.....	Jan. 14-15-16, 1914..	St. Paul.....	G. Ed. Leech, Winona.
Minnesota State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.....	June 30, July 1-2, '13.	Omaha.....	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n.....	July, 1913.....	Kirkville.....	S. Stewart, Kansas City.
Montana State V. M. A.....	Sept. 24, 25, 1913.....	Helena.....	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.....	1st Mo. & Tu., Dec. '13	Lincoln, Neb.....	Carl J. Norden, Nebraska City.
New York S. V. M. Soc'y.....	Sept., 1914.....	Rochester.....	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.....	June, 1914.....	Wilson.....	J. P. Spoon, Burlington.
North Dakota V. M. Ass'n.....	Aug. 6-7, 1913.....	Fargo.....	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.....	Nov. 1913.....	Delphos.....	E. V. Hover, Delphos.
Ohio State V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med.....	Annually.....	Upper Sandusky.	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.....	Fall, 1913.....	Oklahoma City..	J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.....	1st Week in Feb. 1914	Toronto.....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.....	Sept. 16, 1913.....	Not selected.....	L. A. Willson, Toronto.
Pennsylvania State V. M. A.....	Call of President.....	Manila.....	John Reichel, Glenolden.
Philippine V. M. A.....	4th Tues. each month.....	Portland, Ore.....	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.....	Mon. and Que.....	Providence.....	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.....	Jan. and June.....	Pending.....	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Pending.....	Fillmore.....	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns.....	Aug. 5-6-7 1913.....	St. Louis.....	B. K. McInnes, Charleston.
South Illinois V. M. and Surg. Ass'n.....	1st Wed. fol. the 2d Sun. each month.....	Reading.....	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors.....	June 18, 1913.....	Philadelphia.....	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.....	Pending.....	Madison.....	W. G. Huwett, Wernersville.
Soc. Vet. Alumni Univ. Penn.....	Jan., Apl., July, Oct..	Los Angeles.....	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.....	4th Tues. each month.....	407 Illinois Ave.....	S. W. Allen, Watertown.
Southern Aux. of Cal. S. V. M. Ass'n.....	November, 1913.....	Memphis.....	J. A. Dell, Los Angeles.
South St. Joseph Ass'n of Vet. Insp.....	Nov., 1913.....	College Station..	H. R. Collins, South St. Joseph.
Tennessee Vet. Med. Ass'n.....	2d Thu. each month.....	St. P.-Minneap..	O. L. McMahon, Columbia.
Texas V. M. Ass'n.....	Pending.....	Pending.....	Allen J. Foster, Marshall.
Twin City V. M. Ass'n.....	3d Wed. each month.....	514 9th St., N.W.	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.....	Feb. & July each yr.....	Winipeg.....	A. J. Webb, Layton.
Vermont Vet. Med. Ass'n.....	July 10, 1913.....	Jersey City.....	G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.....	1st Wed. each month.....	141 W. 54th St..	C. H. H. Sweetapple, For. Saskat- chewan, Alta., Can.
Vet. Ass'n Dist. of Columbia.....	Monthly.....	Jersey City.....	M. Page Smith, Washington, D. C.
Vet. Ass'n of Manitoba.....	July 10, 1913.....	141 W. 54th St..	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.....	1st Wed. each month.....	Pullman.....	E. L. Loblein, New Brunswick.
V. M. Ass'n, New York City.....	Monthly.....	Walla Walla.....	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.....	July 10, 1913.....	Pittsburgh.....	T. F. O'Dea Union Hill, N. J.
Virginia State V. M. Ass'n.....	1st & 3d Fri. Eve.....	Milwaukee.....	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.....	June 1914.....	York.....	R. J. Donohue, Pullman.
Washington State V. M. A.....	3d Thu. each month.....		Carl Cozier, Bellingham.
Western Penn. V. M. Ass'n.....	July 16-17, 1913.....		Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.....	June, Sept., Dec., Mar.		J. W. Beckwith, Shallsburg.
York Co. (Pa.) V. M. A.....			E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. Copy for advertisements should be received by 10th of month.

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

ON THE TOP half of the inside front cover-page, veterinarians will find something of especial interest to them. If you write the Hoffman-La Roche Company, mentioning the REVIEW, they will send you literature and particulars.

HOG CHOLERA IS ONE OF THE VITAL QUESTIONS OF THE DAY; so is the selection of Hog Cholera Serum a vital question. Turn to page 21 (adv. dept.) and see the announcement of the Imperial Serum Company. Write them for information regarding their product, and be sure to mention the REVIEW, and you will get a prompt reply.

THERAPOGEN ONCE MORE. Veterinarians everywhere will be pleased to learn that that excellent antiseptic with the pleasant aroma is once more obtainable in this country. Those who used it some years ago have missed it very much, but by turning to page 27 (adv. dept.) of this issue, they will learn the address of the house that can supply their needs. Mention the REVIEW when writing.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., OF THE AMERICAN VETERINARY REVIEW, PUBLISHED MONTHLY AT 509 WEST 152D STREET, NEW YORK, N. Y., REQUIRED BY THE ACT OF AUGUST 24, 1912.

Editors—A. Liautard and Robt. W. Ellis, 509 West 152d Street, New York.

Managing Editor—Robt. W. Ellis, 509 West 152d Street, New York.

Business Manager—Robt. W. Ellis, 509 West 152d Street, New York.

Publisher—American Veterinary Review, 509 West 152d Street, New York.

Owners: (If a corporation, give names and addresses of stockholders holding 1 per cent. or more of total amount of stock)—A. Liautard, 14 Ave. de l'Opera, Paris, France; Robt. W. Ellis, 509 West 152d Street, New York, N. Y.; G. M. Ellis, 509 West 152d Street, New York, N. Y.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities—None.

ROBT. W. ELLIS, Bus. Mgr.

Sworn to and subscribed before me this 24th day of September, 1913.

(Seal.)

MOSES MORRIS, Notary Public,
New York County, No. 133, New York Register No. 4049.
(My commission expires March 30, 1914.)

AMERICAN VETERINARY REVIEW.

DECEMBER, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, OCTOBER 15, 1913.

EPIZOOTIC ABORTION IN BOVINES.—Amongst all the questions of important interest in veterinary medicine, *Epizootic Abortion* is one which has the right to claim a first place, interesting as it does, medicine and agriculture.

During a long time, epizootic abortion has been classified in the too long list of diseases, of which little or nothing was known. Perhaps information of some value was published relating to the mysteries that surrounded it; but it is Prof. Bang who has the honor of being the first to lead in the proper direction the study of abortion by experimental method.

Bang and Stribold discovered, in Denmark, a small bacillus which they considered as the agent of the disease. For a long time this discovery was the only one made. Only few experimentators confirmed it and yet the bacillus of Bang did not occupy the rank it should; so many other microbes being also claimed as being the agent of the disease by others. It is only in later days that the discovery of Bang was accepted. An English committee show that epizootic abortion was due to the bacillus of Bang, by a long series of valuable experiments, which were carried out and continued by those learned veterinarians, Sir John McFadyean and Sir Stockman. The discovery of Bang

was also confirmed by experiments and researches made in the United States, where the disease was prevailing more or less.

The fact then was no longer disputed that the bacillus of Bang is truly the cause of epizootic abortion in bovines, a specific disease, which must not be mistaken for other contagious abortions which are not due to the bacillus of Bang; such as contagious vaginitis which may be complicated with contagious abortion, and others which are not due to the specific bacillus of the epizootic abortion proper.

The discovery of the bacillus, the study of its characters, might be considered as facts of little importance if the researches started by Bang had not served and conducted to other observations.

To establish an efficacious system of prophylaxy, it was important to know exactly the ways of entrance of the infection. Sir John McFadyean has most completely solved the problem by experiments that show that infection can take place by the introduction of the virus through the mouth, the vagina or the sheath. Infection through this last entrance had not yet been realized and its demonstration is very interesting. Up to then, infection by bulls was considered as being only possible through the sheath, but the proof that it may as well take place through the mouth render the danger more evident and directly dangerous.

* * *

The retrospective diagnosis of abortion is easy. The fact itself, its contagiousity, its prodromes, the characters of the placenta, the bacteriological examination are, especially if associated together, sufficient to insure the diagnosis. But with these means, the disease may not be recognized except after it has manifested itself. They do not permit one to recognize the cows which are infected, those that will abort and that it would be important to isolate and separate from the healthy ones.

Sir John McFadyean and Sir Stockman were the first to demonstrate that the early diagnosis of the infection can be made by the exhibition of the specific properties of the serum. At

first they thought to use *Abortine*, a sterile extract of cultures of the bacilli of Bang, analogous to tuberculine. The results were not satisfactory.

The sero-diagnosis is better and can be made by agglutination or the method of the deviation of the complement. Both methods give satisfactory and precise answers. Agglutination however has a more simple technic. The method is specific, as all infected animals and those *only*, react. But all animals whose sero-diagnosis is positive may not necessarily abort; as abortion is only a symptom of the infection and this may exist and grant a certain immunity to the animal without abortion taking place. However, all the infected animals are dangerous; milch cows throw out bacilli in their milk and perhaps through other channels, all must be considered as dangerous.

Notwithstanding all that is known of the disease, its prophylaxy is not very advanced. All the sanitary measures find their immediate indications, isolation, disinfection, washing and disinfecting genital organs, etc. Chimiotherapy has given some good results, yet subcutaneous injections of phenol have failed. Vaccination has also been tried unsuccessfully.

Recently, Sir John McFadyean and Sir Stockman have tried the inoculations of living bacilli so as to confer immunity. The results obtained to this day are very encouraging and justify the hopes that at an early date *Epizootic Abortion* will be ranked among the scourges of animals that can be prevented.

* * *

HUMAN AND VETERINARY SURGERY.—In using this heading, in relation to the record of a case published by Prof. Coquot of Alfort, I merely desire to recall the fact that after all, whether in man or in animals, surgery is always the same in finding its applications, in cases of similar nature, requiring the same manipulations, asking the same conditions and in many instances ending in results of equal importance. In fact, veterinarians have often borrowed from human surgeons their *modus operandi*, and if they have not made as brilliant or numerous records, they

can nevertheless mention a number which call for special attention, as is the case suggesting this heading and has for title in the *Recueil* "COMPLETE EVERSION OF THE BLADDER, CYSTECTOMY, URTEROPESIA, RECOVERY." Evagination of the bladder, through the urethra and the ordinary meatus is a rare accident in mares, as although 53 cases are spoken of by Lanzilloti Buonsanti, only 3 well studied cases are spoken of in French periodicals.

The subject of this case was a mare, which had been delivered of a living colt, not without difficulty, as during the labor a perforation of the vagino-rectal wall and a complete evagination of the bladder had taken place through the violent efforts of the mother. Attempts had been made to reduce this, but without results, and the mare was sent to the learned professor, who had no difficulty in making a diagnosis with the characteristic condition of the animal and of the injured region.

Between both lips of the vulva and resting on the lower commissure there was a globular pisiform tumour as big as a child's head, and pedunculated. The appearance of the mucous membrane, the presence of the two little tubercles that represent the ureters, the urinary fluid that covers the parts and also now and then escapes by streams through the ureters, etc., everything confirms the diagnosis.

Although the reduction has already been tried several times during the three weeks that the mare is in that condition other attempts are made, using the greatest care to avoid the laceration of the organ, which is threatening by the condition of the bladder. All have failed, and a radical surgical interference is the last resource, which imposes itself, including cystectomy and ureteropesy; ablation of the prolapsed mass made as near as possible to the neck of the bladder after dissection of the ureters and then suture of those to the walls of the vagina.

*
* *

The operation was made in four steps:

First.—DISSECTION OF THE URETERS.—This was made easier by the introduction in both canals of a rubber probe 3 millimeters

in diameter. The dissection was rendered quite delicate on account of an abundant hemorrhage. It extended on a length of about four centimeters.

Second.—SUTURE OF THE URETERS TO THE VAGINAL WALLS.—Made on the point of union of the vulva and vagina, with simple stitches, the suture of the ureters brought together the dissected part of the canals with the vaginal mucous membrane, incised with the bistouri.

Third.—APPLICATION OF AN ELASTIC LIGATURE.—This was placed one centimeter back of the points where the dissection of the ureters was stopped. To avoid the slipping of the ligature, a circular incision of the vesical mucous membrane had to be made. And so as to insure to the rubber cord a greater fixity, a stitch of silk was applied in front and back of it, through the middle of the pedunculum, formed by the protrusion of the evaginated organ.

Fourth.—ABLATION OF THE BLADDER.—This was cut away with a bistouri, 4 centimeters back of the elastic ligature.

The after care consisted in washing the vagina twice a day with physiological serum, followed by oxygenated water. Slight reaction took place on the third day with raising of the temperature and general dullness of the animal.

During the first 10 days micturition was irregular, taking place with great expulsive effort in variable quantity and every 15 minutes by drops or in small streams, soiling the inside of the thighs and hocks. But this condition gradually improved. The expulsion of the urine took place at various intervals, escaping at the lower commissure of the vulva, the animal stretching herself, about every fifteen or twenty minutes and throwing out about half a litre of urine at each time, that is, when a certain quantity of urine had collected in the floor of the vagina, which then filled the place of a temporary reservoir until a nervous reflex stimulated its contractions and gave rise to micturition.

This recovery, which required only one month to take place, shows that evagination of the bladder heretofore considered as a very serious, if not fatally ending, accident, can be the subject

of successful surgical interference, which will permit of saving an animal and allow him to render a certain amount of good work after a relatively short length of time.

Such cases are rare, it is admitted, but such favorable results as those obtained here deserve to be known.

*
* *
*

RABIES IN SOLIPEDS.—The *Revue Generale* has published lately the records of two cases of *Rabies*, one in a horse, the other in a male donkey, which have given occasion for wise remarks from the authors. The symptoms of the disease, when it was developed, were in both subjects classical, but the fact of the rare occurrence of rabies in equines, the relatively slow process that one (the horse) presented and the difficult circumstances of the first examination which took place at night with light only, had not permitted a correct diagnosis at once. The horse being then treated for a simple case of pharyngitis, that his condition justified.

But when he began to show nervous manifestations besides refusing his food, breaking his halter rope, upsetting everything in his stable, staggering more or less in walking, and also pushing his head against the wall, the possibility that a nervous disease of some kind was developing was considered, and venesection recommended with ice to the head, and intestinal revulsion. As the animal was about being fixed for being bled, his physiognomy became haggard, his features contracted, he became snappish and rabies became evident, although no history of the horse having been bitten was obtained. It had taken some three or four days for rabies to become fully developed, and the groom was bitten, although he had been put on his guard.

The disease ran its course then normally. At one o'clock it was in its acme, the animal had spells of rage now and then, and at ten o'clock he was dead.

The diagnosis with the donkey was made readily. The disease with him occurred a few days after that of the horse, and ran its course in a few hours.

Careful inquiry made it suspicious that both animals had been bitten by the same mad dog. The period of supposed incubation was between 2 and 3 months, the inoculation having taken place at the point of the nose. Many mad dogs had been killed in the region where these two cases were observed, and the indications are that in such circumstances it is prudent to watch all animals liable to have been exposed and bitten, and in case of any presenting any abnormal manifestations in their health to bear in mind the possibility of hydrophobia.

*
* *
*

BIBLIOGRAPHIC REVIEWS—*STOMOXYS CALCITRANS*.—Dr. M. Bruin Mitzmann, veterinary entomologist, and Dr. Archibald R. Ward, chief veterinarian, have favored me with Bulletin No. 24 of the Bureau of Agriculture of the Government of the Philippine Islands. *The Role of the Stomoxys Calcitrans in the transmission of Trypanosoma Evansi*, where after presenting the literature in reference to the subject, they consider the various methods they have resorted to in their experiments by the mechanical transmission. They then treated of the relations of the non-biting flies to stomoxys in contaminative infection, gave of the cyclical development of trypanosoma evansi in stomoxys calcitrans, the question of hereditary transmission, the methods employed in feeding and keeping flies for laboratory purposes and those of applying flies to the host, and concluded their very interesting bulletin with the following general summary:

1. Only negative results were obtained in the attempts at direct mechanical transmission of surra with flies, which were induced to bite healthy animals at intervals ranging from five minutes to three days, after being permitted to complete the feeding upon infected animals. Thousands of stomoxys calcitrans were employed in 29 experiments, involving the use of 3 horses, 6 monkeys and 22 guinea pigs.

2. Twenty-seven experiments were performed in attempts to transmit Surra by the interrupted method of feeding. All attempts proved negative *where a single application of a varying*

number of flies was used, as many as 38 on a horse, and a maximum of 40 on a small guinea pig. The intervals between feeding on infected and healthy animals averaged 25 to 40 seconds in the two instances cited.

3. In three experiments, interrupted feeding was employed in successive applications. In attempting to determine the minimum number of bites necessary to infect an animal as high as 40 were followed by negative results. The only positive one obtained was produced from a succession of 206 interrupted bites in which the flies were transferred immediately from the infected to the clean animal. The flies were applied 32 hours during a period of six days.

4. The results of these experiments indicate that *Trypanosoma Evansi* does not develop in the body of *Stomoxys Calcitrans*. Ninety-four days was the longest period in which laboratory bred flies were tested for a cyclical development, and sixty-seven days the maximum for wild flies.

5. Organisms of Surra were not found in *Stomoxys Calcitrans* beyond 18 days after feeding on an infected animal, and the limit for infection by inoculation was ascertained in these experiments to be six hours.

6. Pathogenous trypanosomes were found in the proboscis of the fly thirty seconds after feeding on infected blood. Within one minute and thirty seconds the organisms were not present in the mouth parts in a form capable of infecting by inoculation into guinea pigs.

7. The wounds made by the labium of *Stomoxys* were not found to be a suitable channel for infection. Consequently it is not likely that Surra in domestic animals is produced through this avenue by external contamination; namely feces, mouth parts and pulvilli of infected flies.

8. The intimate relation in the feeding habits of *Stomoxys* and of house flies has been pointed out. *Stomoxys* has been demonstrated to provide through its bites the infection of *Musca Domestica* and other dung flies. These flies have been demonstrated to act as carriers, harboring the surra organisms for several hours.

9. No evidence was obtained to indicate that *Typanosome Evansi* is hereditary transmitted to the offspring of *S. Calcitrans*. The larvae of this fly fed on Surra blood does not continue to harbor the trypanosome and the fly is "clean" upon reaching maturity.

10. It is demonstrated that the individual glass-tube method is the most suitable for applying flies in feeding on experimental animals and for keeping flies for long periods under laboratory condition.

* * *

CANCER IN HORSES.—From the annual report of the Sanitary Veterinary Service of the City of Paris, by Mr. H. Martel, Chief, I find in the part concerning the section of *Hippophaic Abattoirs* some interesting statistics upon cancer amongst the horses which were killed in those abattoirs.

Cancer is very frequent in horses, and the statistical researches made in that direction, and which cover examinations of some 40,000 subjects, viz.: 20,000 mares, 16,200 geldings and 3,600 stallions, prove its frequency. The number of cases of cancer observed is 184, without counting those of melanotic sarcoma. Of those 184, 86 were in mares, 43 in geldings, and 55 in stallions.

In relation to the organs which were diseased, these 184 cases are represented by 62 of the kidneys, 50 of the testicles, 45 of the mammae, 9 of the intestines, 6 of the bladder, 2 of the ovary, 2 of the lungs, 1 of the uterus, 1 of the sheath, 1 of the jaw and five of origin not precisely established.

Most of those cases of cancer were observed in subjects advanced in years and above fifteen.

In classifying them according to the pigmentation of the teguments, 118 were found in animals of dark color (black, bays, or chestnut and its varieties), 66 were observed in clear color (white or grey).

In 21 cases pairs of organs were simultaneously affected. For instance, 6 cases were observed in mammae in the two glands,

10 in both testicles, 5 in kidneys. These last existed when the disease was generalized. In the others it was not.

In the cancers of the mammae, cancers were in form of tumours of different sizes in both glands and in each had developed at successive periods of times. In the cases of testicular cancer the development in each seemed to have taken place about the same time. In four cases, the cancer existed in the testicle in condition of abdominal ectopia.

Metastasis of generalization were observed in 66 cases, and in 42 of those involved glands, organs and serous membranes. In cases of testicular cancer generalization by general circulation was never observed.

In relation to melanotic sarcoma, Martel writes: It is extremely rare to find white or grey horses entirely free of melanotic tumours. These are localized preferably in the peri-rectal connective tissue, in the sub-scapular muscles, the parotid, the bones and the lymphatic glands, and are spread most often by the channel of the lymphatic vessels. When the generalization takes place through general circulation, the metastasis develops very rapidly and then mostly in the organs.

To serve to the history of cancer the above statistics are most valuable.

* * *

SUNDRY ACKNOWLEDGMENTS.—*The Philippines Agricultural Review*. The veterinary number of this periodical was received. Published as a monthly by the Bureau of Agriculture in English and Spanish, it indicates the importance that our profession has assumed in the Philippines. This number contains among its special articles, *The History of the College of Veterinary Science* at the University of the Philippines by Dr. D. B. Palmer, D.V.M., and Victor Buencamino, D.V.M., also *The Surra Conveying Fly of the Philippines* and some factors concerned in control measures by Dr. M. Bruin Mitzmain. Observations on *The Clinical Diagnosis of Glanders*, by Dr. C. H. Schultz *Kidney Worm Infestation of Swine*, by D. W. Hutchins

Boynton. The number is illustrated. In the editorial, the practice of veterinary art is alluded to by remarks that place it in the Islands amongst the few states, where such is protected and also those who are regularly graduated. It also tells that at the veterinary college, the requirements for graduation are attendance to lectures for five years, sessions of nine months.

"These are examples worth following."

First annual report of the Director of the Department of Public Health and Charities of the City of Lawrence, in Massachusetts.

Notes on *Complement Fixation* in Glanders by Langdon Frothingam, M.D.V., and Stephen O'Coole, D.V.M.

Chicago veterinary college *Bulletin* and Announcement for 1913.

A. L.

WHAT ARE WE GOING TO DO IN THE UNITED STATES SENATE?

Actions speak louder than words. Faith without works, is dead.

The army veterinary service bill having already been introduced into Congress on May 1st as H. R. 4541, what is to be our plan of action in order to move the bill forward?

In the present month, December, the 63d Congress, under constitutional provision, assembles in its first regular session. The time has arrived when our bill must be made to start on its legislative path. There are four steps to be taken: First, it must be read and passed by the Committee on Military Affairs of the House; second, it must be read and passed by the House as a whole; third, it must be read, and, in either approved or disapproved form, be passed upon by the Senate Military Committee; fourth, it must be approved by the Senate as a whole. Our plan is to begin the movement of the bill with the reading of the House Committee on Military Affairs, where it now is resting in

readiness for the December assembling of Congress. Why? The House has approximately four times as many members as the Senate (395 to 98). The House, therefore, by dint of numbers and direct selection by the people, has always more clearly voiced the thought of the people in its legislation. What passes the House is apt to pass the Senate, if the majority in both are in political agreement as at present. And if the bill passes by a comfortable vote in the House, the chances in the Senate are proportionally better. Many people make the mistake of thinking that there is a great gulf fixed between the Senate and the House and that there is no intercourse between the membership of each body. As a matter of fact, the members of both houses mingle freely in Washington, and there is frequent conference and collusion of members of both houses from regions of the country interested in definite kinds of legislation, or there is agreement and combination of the members of the delegation to Congress of any one State or group of States for furthering particular pieces of legislation. The voice of the House, therefore, most assuredly has effect in the legislation in the Senate by the in season and out of season agreements and understandings. The members of any State delegation sent to Congress soon get to know each other well, and the opinions of the Representatives to Congress from any State impress the minds of the Senators from the same State. Indeed, there can be no mistake in saying that the mind of a Senator from any State is apt to be set or altered by the thought of the majority of the Representatives to Congress from the same State, or by the decisions on pending legislation arrived at by influential Representatives in the State delegation to Congress. Representatives have a strong hold on the minds of the Senators from their regions. This constitutes another important reason, therefore, why we are going to start our bill on its way in the House.

What leverage on the Senate can be had by seeking close acquaintance with Representatives to Congress?

The secret of success in inducing Representatives to Congress to favor and work for the army veterinary service bill consists in seeking close acquaintance with them and showing them

why they must have a personal and vital interest in it. What is good for them and their constituents ought to pass. But when an attempt is to be made to get legislation of this sort the profession becomes divided into two groups, one large and potent; the other small but indifferent. I refer to the *workers* who constitute the first group, and to the *well-meaning but half-hearted sympathizers* who belong in the second group. The workers, a magnificent body of loyal men, constituting the bulk of the profession in America, are ever ready to put their hearts and minds into this reform. The well-meaning but half-hearted sympathizers are those who say, "This is a good thing, I hope the bill will pass and that the boys will get what they want"—and they let the matter go at that. There would be no veterinary reform until the end of the world if such men were in the majority. They are not. The gospel of work is being preached by veterinary reformers, and it is vitalizing all hearts to seek success for this bill. "Faith, without works is dead." Any man who claims he pins his faith to this reform and does not work for it has a fibreless, unreal faith. But the immediate appeals of the workers are converting such men from the error of their ways, and it is high time that this should be so. Because the services of every American veterinarian are in demand to acquaint their Representatives to Congress with the need for this reform. Leverage on the Senate may be had by our educating first of all our Representatives on its needfulness. The size of the vote in favor of the bill in the House will affect the Senate. Our success in educating the members of the House will ease our path in the Senate.

How are we to put the army veterinary service bill through the United States Senate?

1. All chosen immediately by the 90,000,000 of our people and the 5,000,000 in our dependencies, the Representatives to Congress voice the thought of the people directly. The thousands of veterinarians in each State and Territory should seek a close acquaintance with these, the people's representatives, and appeal to them in favor of the bill. Its passage by a handsome majority in the House would ease its course in the Senate.

2. In each State delegation to Congress the influence especially of leading Representatives is to be sought for our measure and for their power to persuade their Senators to aid it. Men are gregarious—they are disposed to go in flocks as leaders point the way.

3. There are Senators who can be won without this plan by veterinarians or their friends who have access to them. Opportunity should not be lost to strengthen the interest of those favorably disposed, or to swing the wavering to the side of the bill.

Winning in the Senate is a matter of thorough campaigning. As the country speaks, the Senate will act. The country speaks as the House of Representatives votes.

G. S.

VETERINARIANS AND THE ALLIED HORSE INTERESTS.

The above caption surmounts a correspondence, published on page 386 of this issue, from Mr. T. Butterworth, editor of *The Live Stock Journal*, Chicago; a paper that has faithfully championed the interests of the horse industry of America under all conditions for the past quarter century; especially the draft horse, the more extensive breeding of which, Mr. Butterworth has unceasingly urged; his keen foresight having foretold a constantly increasing demand despite the advent of the motor truck. In his letter of transmittal, Mr. Butterworth says:

“I enclose you a brief item, of importance to veterinarians, who should take the lead in promoting horsebreeding. Improvement that will in the same proportion advance the veterinary interests and prosperity. The eager market demand at the high price must be met, or the work must be done with the auto-trucks that help the horses but little—the few thousand against our twenty-five millions of horses and mules. Your great paper can do no greater work for the veterinary profession than to rally to the help of

the farmers in this crisis. I started to write the item for my own paper, but it seemed more important for yours, so loyal to the veterinary interests. I am glad to have your co-operation in this good work."

Here is a direct call from the stock-breeding interests to the veterinary profession; let it not go unheeded. There are hundreds, many hundreds, of men in our ranks who can give material help to the horse-breeding interests of America, if they would but disseminate their knowledge through their pens. And the best means of dissemination is through the profession itself. Contribute your knowledge to your brothers in the profession through these pages, and let them in turn disseminate it to their clientele, and it becomes world-wide. Let some Brother write on draft horse breeding, the breeds best adapted for improving our native stock for heavy draft work, and those best adapted to the production of farm horses. Let some other Brother take up the solution of the production of horses for our army service, which has been much discussed out of the profession and is still far from solved. Our markets are only half supplied with business horses for general delivery of household goods, a branch of horse services that mechanical appliances have left untouched except for a few large dry goods houses in the large cities; and a reaction is taking place in some of these, and in other industries that had received the impression that they had to have automobiles to keep abreast of the times, but have since found it to their advantage to return to the horse.

The horse industry of America has nearly a billion dollars' greater valuation than all the cattle, sheep and hogs, or all the grain crops of corn, wheat, oats, barley and rye; a total of thirty million head on the farms and in the cities; the greatest of any nation. But we have not enough for the demands; the horse industry needs encouragement, it needs advice as to its direction and the economical management of breeding problems; and a direct call has come to our profession for such direction and advice, which is a recognition of our ability to aid—nay, direct—the greatest agricultural industry of our country. Let us report for duty without delay.

THE COCAINE LAW AND VETERINARIANS.

On page 410 of this issue we have published a ruling by Attorney General Carmody of the State of New York as to cocaine prescriptions by veterinarians. This ruling makes it clear that druggists may not fill prescriptions calling for cocaine signed by either veterinarians or dentists, and that to members of either of those professions the use of the drug in question is limited to its purchase in original packages and its direct administration to the patient. This law has caused some dissatisfaction on the part of members of the veterinary profession, and some chafing at the collar, not so much on account of the inconvenience that it may have caused them, as that they feel as though they are being discriminated against. They feel that as graduates in medicine (even though it is a special branch) their signature should carry just as much weight on a prescription calling for a dangerous drug as that of their brothers in medicine. And really it does seem as though the law to be consistent should be reversed. The veterinarian's patients cannot become addicted to the cocaine habit, while the physician's patients can, and do. Well, then, would it not seem that if any one class of practitioner should be restricted to its use by direct administration to his patient, that particular class should be the physician, so that there would be no possibility of prescriptions being refilled. The cocaine law may be right in so far as its restriction of the purchase of cocaine to that of obtaining it in its original package and not allowing it to be part of a prescription, if its application was a general one, but its application to veterinarians and dentists only, more particularly the former, we feel is wrong. We should like a free expression of opinion on it from REVIEW readers.

HISTORICAL COMMITTEE, A. V. M. A.

D. Arthur Hughes, Chairman

H. S. Dumphy

Tait Butler

The above is an additional committee received from Secretary Mayo, and not included in the list sent to the REVIEW for publication last month and which appeared on pages 274 and 275.

ORIGINAL ARTICLES.

THE PERSISTENCE OF THE BACILLUS OF INFECTIOUS ABORTION IN THE TISSUES OF ANIMALS.*

BY W. E. COTTON, D.V.M., BUREAU OF ANIMAL INDUSTRY EXPERIMENT STATION, BETHESDA, MD.

It is the purpose of this paper to show that infectious abortion of cattle is one of those diseases in which a very large proportion of the cows, at least those infected with the strains of the disease with which we have worked, harbor the abortion bacillus for a very long time and eliminate it, more or less continuously with their milk, without showing visible lesions in the udder, for months and years after the active manifestations of the disease have subsided. In some instances the bacillus of abortion is eliminated by animals in which active disease has not asserted itself at all. Something will also be said as to the length of time the organism remains in the uterus after abortion, and also as to its persistence in the tissues of small experiment animals.

The work from which the data was obtained was done at the Experiment Station of the Federal Bureau of Animal Industry, at Bethesda, Md., under the direction of Dr. E. C. Schroeder, Superintendent, to whose guidance and help I am greatly indebted both in making the observations and in preparing the data presented.

At the forty-eighth annual meeting of this Association, Dr. Schroeder and I presented a paper (1) in which we described an organism that we had found to be eliminated with the milk of a considerable number of apparently healthy cows; that it was of common occurrence in market milk; and that it produced lesions in guinea pigs which somewhat resembled those produced by the

* Presented to the fiftieth annual meeting of the American Veterinary Medical Association in New York, September, 1913.

tubercle bacillus. At that time we had failed to identify the organism, which we now know to be that of infectious abortion.

To gain some information as to the constancy with which aborting cows eliminate this organism with their milk, and the length of time they persist in doing so, as well as that during which the genital tract remains infected after an abortion, careful watch was kept over all the cows at the Experiment Station; infectious abortion being present among them and slowly infecting the entire herd.

The presence of the abortion bacillus in milk, as well as in other materials, was determined by the inoculation of guinea pigs, in which, as we have pointed out, it produces characteristic lesions. We have also made cultures from many of the guinea pigs showing these lesions, and recovered the bacillus from them. In making tests with guinea pigs, two were inoculated in each instance. In making the milk tests, each guinea pig received from 4 to 6 cubic centimeters of whole milk intra-abdominally; in tests of other material the inoculations were usually made subcutaneously. It should be said of the guinea pigs used in making these tests, as well for all those used for any purpose at the Experiment Station, that of the several thousand that we have autopsied since this investigation has been in progress, we have yet to find lesions of abortion disease in a single guinea pig in which we had not a right to expect to find it. The work is thoroughly checked up by very many tests of milk and other materials, in which guinea pigs were used, both in this and in other investigations.

The reproductive organs of a bull that had been used to serve some of the aborting cows, and the testicles of two bull calves, one of which had been fed and the other injected with cultures of the abortion bacillus, were tested for the presence of this bacillus, but it was not found to be present in any of them, though portions of practically all of the reproductive organs of the adult bull were used in making the tests. We were led to make the above tests because a large proportion of male guinea pigs which are infected with abortion bacilli, develop grave lesions of the testicles and cation last month; and we have found that these males infect females copulate. We also found the lesions to be present

in the epididymis of a rabbit that had received an intro-venous injection of the abortion bacillus a number of weeks previously. We thought it possible that the organism might remain in the testicles and epididymides of the male bovine animals without producing visible lesions, as it does in the udder of the female. So far as our investigations have gone, it seems that the bull does not harbor the bacillus in this manner, but they have not yet progressed far enough to be conclusive.

In our milk tests, we found that of the cows at the Experiment Station nineteen have records of having aborted, of having eliminated the bacillus with their milk, or both. It will be necessary to give the records of a few of these in detail, because of some peculiar conditions in each, and in order to show the regularity with which the organism is eliminated from some animals.

Cow 637 is perhaps of the greatest interest, since it was she in which we first demonstrated that the bacillus was eliminated from the udder, and hence, we have a longer record of her than of the other animals. She was purchased from the Maryland State Experiment Station, and according to its records aborted on September 21, 1907, in the seventh month of pregnancy. She has aborted once since she has been at Bethesda, on July 25, 1911, in the fifth month of pregnancy, the abortion bacillus being found in the fetus.

The first test of her milk, made on February 20, 1909, was positive. Later tests were made as follows: Nine in 1909, four in 1910, fourteen in 1911, thirteen in 1912, and three in 1913; 44 including the first. With the exception of two, made two and three months after abortion, all were positive. She has thus eliminated the abortion bacillus almost continuously for at least $4\frac{1}{4}$ years; and if counted from the time she is reported by the Maryland State Experiment Station to have aborted, which, judging by our experience with other cows, is the probable time at which the milk became infected, would make five years and eight months as the probable time that the organism has persisted in her udder. Her milk when last tested was just as virulent for guinea pigs as it ever was, and we have no reason to believe but that the bacillus will persist in her udder permanently.

She produced a calf fifteen months after the last abortion occurred; tests made of the placenta showed that the bacillus was absent.

A remarkable fact in connection with this cow, as well as with all cows that carry the abortion bacillus in their udders and yet abort a second time, is that the bacillus in the udder did not induce the production of sufficient anti-bodies to prevent the invasion of the uterus and consequent abortion. It is possible that abortion may have been caused by infection with another strain more virulent than the one in her udder, but this idea does not seem to be in harmony with the laws of immunity. An attenuated strain of an organism ought to induce some immunity against a more virulent one and besides in this instance, as nearly as we could determine by cultural methods and guinea pig tests, the organism from the udder and that from the fetus were identical.

Cow 479 is also of interest in this connection, since she has aborted twice, and because of the appearance of the abortion bacillus in the placenta discharged at a normal parturition, the third such since the last abortion, four years and five months after the abortion occurred. This seems to indicate that abortion bacilli sometimes appear in the uterus years after an abortion, but either because of the lateness of their appearance, or the high resistance of the organ, are prevented from damaging the placenta to such a degree as to cause abortion.

We have tested the placentae of two other cows, each passed at the termination of the normal pregnancy following an abortion, and that from a normal birth in a cow that never aborted, but which harbored the abortion bacillus in her udder, all with negative results. Just how frequently the condition observed in cow 479 occurs, I am unable to say, but from the fact that one such case was found out of four animals tested, would indicate that it is not uncommon, and hence it follows, that if aborting cows are permitted to enter healthy herds, that the discharges from the uterus following a subsequent normal parturition must be regarded with suspicion.

While the condition found in this cow may be attributed to a new infection, it seems much more probable that it was due to

the migration of the bacillus from the udder to the active uterus. We have found the supra-mammary glands of cows to be infected, showing that the bacilli were travelling towards the blood stream, and once in that it, is not difficult to conceive of them reaching the pregnant uterus, where, finding a favorable soil in the embryonic tissue which it contains, multiply and set up disease. In some respects the abortion bacillus behaves much like the tubercle bacillus, which may remain latent at some point in the body, till conditions arise that make it possible for it to migrate from the original focus to some organ, the resistance of which is below normal, and set up disease. The abortion bacillus, so far as we know, is able to develop only in the pregnant uterus and the udder; the former being the seat of its greater activity, comparable to the weakened organ in tuberculosis, and the udder the seat of the latent focus from which it is infected.

Tests of this cow's milk showed it to be infected when first tested, November 21, 1910, and that it was still infected, May 5, 1913, twenty-nine months later. Sixteen tests made in 1912, and three in 1913, showed the bacillus to be present in all but two. She has, therefore, eliminated the abortion bacillus from her udder, to our knowledge, for twenty-nine months, and for the last sixteen months, at least, almost continuously. As her second abortion occurred four years and seven months previous to the last milk test, the organism must certainly have persisted since that time, and in all probability since the time of her first abortion, or for a period of five years and seven months. Separate tests made of milk from each quarter of her udder on May 5, 1913, showed that all quarters of this organ were infected.

Cow 751 has aborted twice, in her second and third pregnancies, on December 19, 1911, and on February 11, 1913. Abortion bacilli were found in placenta at first abortion, but not in fetus, and in both placenta and fetus at the last one. Repeated tests of vaginal scrapings proved that the bacillus was eliminated through this channel up to and including the thirteenth day following abortion. Several subsequent tests were negative. In one other animal, the vaginal scrapings were found to be infect-

ious forty-six days after abortion. McFadyean and Stockman (2) found that the bacillus had disappeared from the uterus of a cow killed one month after aborting.

One observation made in connection with this cow proved that uterine discharges containing abortion bacilli can be exposed to the weather for a considerable time and the bacilli remain alive. A large quantity, perhaps 250 c.c., of clear mucous containing islands of chocolate colored flocculent material was passed from her uterus on the eighth day after abortion. It was allowed to remain on the ground, exposed to the sun for ten days, the weather remaining clear for the most part and warm for the season of the year (February), by which time it had dried into a tough leathery-like mass, which on being tested by guinea pig inoculations, was found to contain living abortion bacilli. Unfortunately the material left after the tenth day of exposure was accidentally destroyed, so that we were not able to determine the maximum length of time that the bacillus will remain alive under these conditions.

This cow's milk was found to be infected at the first test made, nine days after her first abortion, and was still found to be infected when last tested, February 15, 1913, thirteen and one-half months later. Twenty-nine tests were made in 1912, and four, in addition to the last one, in 1913. Of all tests made, thirty-one were positive and four negative. She has therefore already eliminated the abortion bacillus almost continuously with her milk for thirteen and one-half months.

We have found the abortion bacillus to make its appearance in the milk of three cows before abortion occurred, and in one of these even before the beginning of the pregnancy which was terminated by an abortion. The one in which this occurred, No. 621, gave birth to a calf at term, on December 20, 1911, tests of milk made eight, thirteen, sixteen and twenty days after, were all negative. The next one, however, made sixty-five days after the birth of the calf, was positive, as were also two others, made six and fifteen days after this. She was served fifty-two days after the bacillus was first found in her milk, and aborted on

November 4, 1912, two hundred and fifty-five days after it was found. Tests of her milk made in the third, fourth, fifth and sixth months of her pregnancy were all positive, as were also daily tests made the first week after abortion, and six others made at irregular intervals, the last of which was made on May 26, 1913. She has then continuously eliminated the bacillus with her milk beginning nearly two months before the beginning of a pregnancy which was terminated by an abortion, and has continued to do so with great regularity up to the last time her milk was tested, a period of fifteen months.

The record of this animal shows that a cow's milk may become infected before conception, and seems to indicate that instead of the presence of the bacillus inducing immunity when introduced at this time, as has been supposed, it is stored in the udder till the uterus by becoming active furnishes a soil for its rapid multiplication. It seems therefore that any system of immunization that depends on the subcutaneous or intravenous injections of living cultures of this organism before conception is unsafe; for it would not only probably make most of the animals so treated carriers, and contaminate their milk, but would, at least occasionally, set up active disease. I do not want to be understood as opposed to efforts to evolve methods for immunization, and I hope that something can be done in this direction. but immunity in this disease seems to be such an uncertain quantity, and the possibilities for evil in this organism, not only for animals but for man as well, so great that we had better go slowly.

The two other cows in which the bacillus appeared in the milk before abortion are Nos. 616 and 760. In the first of these, the abortion bacillus was found in the milk 32 days before abortion occurred; the next preceding test was made nearly a year before and was negative, had tests been made between these it is possible that we would have found the bacillus present at a much earlier date. Thirty-five tests of her milk have been made subsequent to the first positive one, of which thirteen were positive and twenty-two negative, the last one giving positive results being made eleven months after her milk was first found to be

infected; four succeeding tests were negative. She therefore began to eliminate the abortion bacillus with her milk at least a month before abortion, and continued to do so intermittently for eleven months, after which it seemed to disappear, though owing to the intermittent character of its elimination, we can not be sure of this till other tests are made.

The abortion bacillus was found in the milk of cow 760 sixty-three days before her first abortion, which occurred in the sixth month of her second pregnancy; but four tests made about four months before abortion were negative. She aborted a second time in the 8th month of her next pregnancy, abortion bacilli being recovered from placentae and fetal organs of both pregnancies. Sixteen tests of her milk have been made at intervals of from one day to two and one-half months, the last being made eleven months after the first positive one. Thirteen of these, of which the last was one, gave positive results.

Three cows, Nos. 171, 503 and 638, have never aborted, yet have continued to harbor the abortion bacillus in their udders. They are somewhat like those cases in man which continue to harbor the typhoid bacillus though they have never manifested symptoms of the disease. For some reason, the uteri of these cows seem to have either inherited or acquired sufficient resistance to prevent the organism from developing there, at least to such an extent as to produce abortion, though it continues to persist and to multiply in their udders; sufficient general immunity not being produced to drive it from this stronghold. Has the abortion bacillus, present in the udders of these cows, induced immunity in their uteri which it failed to do in cows 637 and 621, or must we regard these organs as naturally immune in these cows, or is there some other reason?

Mohler and Traum (3), Larson (4) and others have shown that some cows react to the complement fixation test but do not abort. No doubt many such are of the kind just described, and that the reaction depends on the actual presence of the abortion bacillus. In other words, a cow reacting to this test probably has the organism either in her udder or uterus.

This type of carrier is a dangerous one, because unsuspected, and can only be found by making milk tests, or one of the serologic tests. Some simple reliable test is urgently needed, and it is to be hoped that such a one will be perfected in the near future.

The records of these cows are as follows:

Cow 171 was born at the Experiment Station, has produced eight normal calves and has never aborted. Abortion bacilli were found in her milk the first time it was tested, April 24, 1911, about three months after the birth of her last calf. Thirty-six tests were made in 1911, in April, May, June, August and November, all of which proved to be positive. She was served six times, beginning about a year after the birth of her last calf, but did not become pregnant and was killed, March 21, 1913, when abortion bacilli were still found in her udder, over twenty-two and one-half months after they were first found. The strain of bacillus eliminated by her was particularly virulent for guinea pigs.

Cow 503 came to the Station when eighteen months old and is known to us to have never aborted. She has produced five calves and is again due to calve in October. Tests were made of placenta of last pregnancy, but no abortion bacilli were found. The first test of her milk, made in November 1910, showed the abortion bacillus to be present, and it was still present in December, 1912, over two years later. Twenty-eight tests made in 1910, 1912 and 1913, showed the bacillus to be present in seventeen and absent in eleven.

Cow 638 has not aborted since she came to the Bureau Experiment Station. She was purchased from the Maryland State Experiment Station five years ago, and according to the records of that institution had not aborted up to the time we received her. She has produced five calves since then. The abortion bacillus was found in her milk the first time it was tested, January 24, 1911, and also at the last test, June 6, 1913, or over three years and four months later. Fifty-seven milk tests were made as follows: Twenty-three in 1910, eighteen in 1911, six in 1912, and ten in 1913. Forty-nine of these were positive and eight nega-

tive; all those made this year being positive. Separate tests of milk from each quarter of udder, made on February 2, 1911, showed all quarters to be infected. Similar tests made on May 6, and on June 6, 1913, showed three-quarters to be.

Nine other cows which have aborted in from the fifth to the eighth month of their pregnancies, have already been eliminating the abortion bacillus, some continuously, some intermittently, for periods varying from two and one-half to twenty-nine months, and if kept under observation longer, I have no doubt will continue to do so for months and years to come, for in none of them is there evidence of the infection dying out.

One cow, No. 758, that aborted a fetus in which the abortion bacillus was demonstrated, has given negative results to all milk tests thus far made. She is certainly the exception that proves the rule. Her abortion occurred in the seventh month of her second pregnancy. It is possible that even in this cow more frequent tests would have revealed the bacillus in her milk, for we have one other cow the milk of which shows infection only at long intervals.

SUMMARY.

Of the nineteen cows under discussion, eighteen have eliminated the abortion bacillus with their milk, sixteen are known to have aborted, three have not aborted but eliminated the bacillus with their milk, and one aborted but we were unable to find that her milk was infected though abortion bacilli were found in the fetus.

One cow is known to have been eliminating the bacillus with her milk practically continuously for four years and three months. One almost continuously for two years and five months and the organism must have persisted in her body for at least four years and seven months; one almost continuously for thirteen and one-half months; one continuously for fifteen months; one intermittently for eleven months; one almost continuously for eleven months; one continuously for six and one-half months, then she became dry and the bacillus was still present in her udder tissue

thirteen and one-half months later; one intermittently for over two years; one almost continuously for over three years and four months, and nine continuously or intermittently for from two and one-half to twenty-nine months.

Since different strains of this organism seem to possess widely different cultural characteristics as well as degrees of virulence, it is possible that animals infected with other strains than those with which we have worked may give different results. Fabyan (5), however, found out of a herd of twelve cows two which eliminated the organism in their milk. One of these had aborted a week before in the eighth month of pregnancy and the other gave birth to a normal calf eleven months before. Another cow aborting at the third month was negative. These results are confirmatory of our observations.

PERSISTENCE IN SMALL EXPERIMENT ANIMALS.

Just a word as to the persistence of the organism in the tissues of guinea pigs, rabbits and mice. We have recovered the bacillus from the spleens of guinea pigs showing lesions, seventy-one and seventy-seven weeks after infection. Tests made of five other guinea pigs which had been injected with the abortion bacillus twenty-one to twenty-seven months previously, and which showed only very slight lesions on autopsy, were negative.

The apparently normal spleen and liver of a rabbit, which had received three intra-venous injections of abortion bacilli, were found to contain the organism one hundred thirty-one days, or nearly nineteen weeks after the last injection was made. The organism was found to be present in the spleens of three white mice, in which it produced lesions one hundred three days, or nearly fifteen weeks after inoculation.

Fabyan (6) reports finding the organism to be present for sixty-seven weeks in guinea pigs, ten weeks in the spleen of a rabbit, and for considerable periods in the tissues of monkeys, rats, mice and pigeons after injections with abortion bacilli: though with the exception of the guinea pigs and mice without producing lesions.

CONCLUSIONS.

1. The bacillus of infectious abortion, or at least the strains with which the Experiment Station has worked, may, and in most cases does, persist in the udders of cows that have aborted for years and possibly for the balance of their lives; and during this time is eliminated more or less continuously with their milk.

2. It may make its appearance in the milk months before abortion occurs, even before a conception that is terminated by an abortion.

3. It may be eliminated for years from the udders of cows that never aborted.

4. It may persist in the genital tract for as much as forty-six days after an abortion; and the bacilli contained in uterine discharges may resist the action of sun and weather for at least ten days.

5. It may appear in the placenta of a normal pregnancy subsequent to an abortion.

6. It may persist in the spleens of inoculated guinea pigs in which there are lesions for seventy-seven weeks, and in the spleens of inoculated rabbits for nineteen weeks, without producing lesions.

It is to be hoped that we will soon know more about this strange organism. Its variable character and the seeming existence of many strains, no doubt, are responsible for much of the confusion in the past, and the fact that it seems to prefer primitive embryonic tissue as a soil, suggests that it may be an organism not yet fully adapted to differentiated tissue, and ready, by a process of mutation, to assume additional pathogenic significance in several species of animals. In other words it may be the possible parent germ of some future pathological factor.

REFERENCES.

1. Schroeder and Cotton, Proceedings of American Veterinary Medical Association, 1911, p. 442. See also AMERICAN VETERINARY REVIEW, Nov., 11, 1911, pp. 195-206, and Twenty-eighth Annual Report of the U. S. Bureau of Animal Industry, 1911, pp. 139-146.
2. McFadyean and Stockman, Report of British Committee on Epizootic Abortion, 1909, Appendix K, p. 40.
3. Mohler and Traum, Twenty-eighth Annual Report, Bureau of Animal Industry, p. 174.
4. Larson, W. P., Journal of Infectious Diseases, March, 1912, p. 184.
5. Fabyan, Marshall, Journal of Medical Research, May, 1913, p. 88.
6. Fabyan, Marshall, Journal of Medical Research, May, 1913, p. 82.

THE TISSUE MEDIUM.

BY JOHN A. McLAUGHLIN, D.V.S., NEW YORK, N. Y.

A tissue medium is essential to the organism. It is only by such a medium the tissues can exist, and on the existence of the tissues depends the existence of the organism. To study this medium and the phenomena attending its production, is the object of this paper.

Digestion—Digestion is the preparation food undergoes in the alimentary canal, to the end of producing the tissue medium. Food exists in the outside world, and consists of organic and inorganic matter. Not all organic, or all inorganic matter, is fit for food; some are without nutritive value, some are incapable of digestion, some are injurious, some fatally so. I mention this because I wish to lay stress on the fact that the animal organism is possessed of a wonderful power in its choice of food, and without such a wonderful power being inherent in it, animal life, at least large animal life, would long ago have ceased to exist.

Tissues constitute the material of which the animal organism is composed. Tissues themselves are composed of cells, plus cell products. The tissues are so arranged as to form systems, apparatuses and organs, each playing its individual part, but all playing towards the same ultimate end, to the production of the tissue medium. The life of the tissues depends on powers peculiar to themselves, but to exert their powers they must be supplied with an appropriate medium. Each cell of a tissue is a living unit. Quoting from Chauveau: "The cell is pre-eminently the anatomical element. The cell lives like an entire organism: it feeds, grows, multiplies, absorbs, secretes, moves, etc. It behaves like a complete animal, though it be a microscopical one." The organism supplies this medium.

Digestion is the first process toward producing this medium. The process in its entirety is composed of a number of lesser processes, the first of which begins with the selection of, and the introduction of food into the mouth, the last with the production of *chyme*.

To produce chyme, the food must undergo three special processes: *first*, that which takes place in the mouth; *second*, that which takes place in the stomach; *third*, that which takes place in the intestine. Resulting from these processes is the chyme, also a large residue, which is eliminated by the inferior part of the alimentary canal.

A study of the alimentary canal shows a beautiful arrangement of its several parts, with one exception—the arrangement of the liver and pancreas. To this exception I will refer later. A study of the mouth describes a cavity (buccal cavity) in which the various parts are put together in such a manner that it is impossible to misinterpret the oneness of their function. Teeth masticate, the lower jaw is movable, the tongue rolls the morsel of food, other muscles assisting, whilst the salivary glands are so arranged as to permit of no doubt of their function as accessory organs, and no possible error as to the function of the saliva. The buccal cavity is certainly beautifully arranged to perform the first process in digestion, for it is constructed with every regard for mechanical laws, especially that law regarding economy of space.

The stomach is also built in the same beautiful manner, and with the same regard for mechanical principles, and if possible, with an even greater regard for that particular principle, economy of space. The muscles which triturate the food practically constitute its walls, and within the inner lining of these walls are the gastric cells, whilst its inlet and outlet are so constructed as to permit the easy entrance of food, whilst it prevents its egress until acted on by the gastric juice.

In the small intestines we find the same plan of structure, the same regard for mechanical principles, the same emphasis on the conservation of space, except, as I have stated, where the liver

and pancreas are concerned. Here mechanical principles, if not cast aside entirely, are not treated with due attention, especially as regards conservation of space, for these organs, instead of being in close touch with the intestines as are the salivary glands with the buccal cavity, and the gastric cells with the stomach, are situated in the abdominal cavity. I have dwelt much on this lack of harmony in mechanical principles, for I intend advancing a theory that is in accord with them.

The production of chyme, then, is the result of three processes. When we analyze these three processes further, we find that in the mouth there is but one secretion, in the stomach but one, but in the small intestines three. Why three in the small intestine? Why this difference, not only in the structural arrangement of its various parts, but in the number of its secretions? As far as I can discover, physiology gives no satisfactory answer. As yet we are not a unit on the functions of the bile and pancreatic fluid.

In the production of chyme, however, the alimentary canal has performed its mission. With the disappearance of this chyme, the sensation of hunger makes its appearance. I mention this to draw attention to a deduction that as *hunger* is peculiar to the alimentary canal, so *thirst* is peculiar to the great Lymphatic System, as *oxygen* is peculiar to the circulatory apparatus.

The Alimentary Lymphatics—After the alimentary canal has completed its part in the production of the tissue medium, it is still an imperfect medium. No one argues for a moment that the tissues could exist in a medium of chyme. As a matter of fact chyme is toxic to the tissues. It remains, therefore, for some other apparatus or apparatuses to continue and eventually complete this task. As the chyme immediately passes into the alimentary lymphatic vessels, I interpret the work of this part of the lymphatic system as continuing the work begun in the alimentary apparatus. In fact I interpret the function of the *Great Lymphatic System*, as continuing and eventually completing the production of the tissue medium.

As we continue our investigation we find that the alimentary lymphatics change chyme to chyle, and empty this chyle into the circulatory apparatus. This chyle means everything that passes from the alimentary canal into these lymphatic vessels, and these vessels transport every particle of it to the veins. A great many changes occur in the composition of the chyle from the time it enters these vessels until it leaves them, but the change is *en masse*, so to speak; I can only compare it to the ripening of fruit. Chyme is toxic but chyle is not, at least not when it passes into the veins. I do not mean to infer that chyle, even when it constitutes the blood, is absolutely harmless, or indeed not very harmful; quite the contrary; but its toxic properties are so modified that they may be eliminated from the system before their toxic effects are apparent.

I wish to call attention to one faculty all parts of the *Great Lymphatic System* possesses in common: They take into their interior and with the same avidity, injurious as well as beneficial substances; it is immaterial what gets into the system, whether it is good, bad or indifferent, the lymphatics carry it to the veins; they have no selective power of their own.

It will be noticed that I have ignored the theory of *absorption*. The omission is intentional. My belief is that absorption performs no special function in the organism, much less such an important one as changing chyme to chyle. Absorption, while a function of dead tissue, is antagonized by living tissue. In rejecting the theory of absorption, I am not entirely alone. Hofmeister has "identified himself with the theory that the absorption of peptone is not a purely mechanical process of diffusion or filtration, but that it represents a function of certain living cells or leucocytes, which in the assimilation of albuminoids fill a rôle analogous to that of the red corpuscles in respiration. He assumes that the reason why peptone cannot be recognized in the blood is because it has combined with these lymphatic cells, and is, through their mediation, transported to different parts of the body; and he regards the rapid proliferation of the cells of the adenoid tissue of the intestinal mucous membrane and of

Peyer's patches as a morphological expression of the chemical processes of assimilation occurring in these tissues."

"Thus it seems," continues R. Meade Smith, "that the process of absorption is as much a vital one as that of secretion, and that the epithelial cell, or lymphatic cell, not only aids the taking of fat into the blood, but also that of peptone (changing it into albumen), and of sugar and salts."

I will mention here an assumption that I may not have made clear; the assumption is that the alimentary canal, the lymphatic system and the circulatory apparatus are empty, when we begin the study of the tissue medium. On this assumption, there is no blood in the mesenteric veins, so that absorption is impossible, and in foetal life I have never heard that the bile acids were absorbed.

Blood—Oxygen (Plasma, the Tissue Medium)—The blood is the chyle. Its name is changed as soon as it enters the veins, but not its composition. The first change is produced in the lungs. Until the blood enters the lungs its composition is the result of changes produced in the alimentary canal and alimentary lymphatics, but in those organs (the lungs) very remarkable changes occur. It is important to know what influence these changes have on the "upbuild" of the tissue medium, for as soon as the blood leaves the lungs, it goes direct to the tissues, showing that no further changes are necessary, and the establishment of the tissue medium is now an established fact.

In studying this particular point, I must recall again to your memory my assumption, that the circulatory apparatus is empty. The blood which is now in the lungs is simply chyle; it has not as yet any tissue-waste in its composition. Every phenomena occurring in the blood while in the lungs results from the addition of oxygen to *chyle*. As far as I can discover, oxygen has very little influence on plasma, and having very little, I conclude the lungs have very little influence on the "upbuild" of the tissue medium; in fact, I believe it has nothing at all to do with it. This leaves this very important function (the production of the tissue medium) to the alimentary canal and the *Great Lymphatic Sys-*

tem. I say *Great Lymphatic System*, though I have so far only mentioned the alimentary lymphatics, but my explanation as to how the systemic lymphatics take part in the "upbuild" is as follows: The chyle has in its composition when it enters the lungs many substances which are still capable of producing the tissue medium; these ingredients of the chyle pass through the lungs unchanged, also through the circulatory apparatus unchanged, and form part of the composition of the plasma, which passes into the systemic lymphatics, and the glands of this part of the *Great Lymphatic System* continue the work of the alimentary canal and the alimentary lymphatics.

Although I state that oxygen has no influence on the "upbuild" of the tissue medium, I do not mean that it has no influence on its welfare; quite the contrary, for I consider it to be of the greatest importance to its welfare, for it oxidizes the injurious substances existing in the blood, which are a constant menace to it, and as a result of which oxidization these injurious substances are eliminated, whereas, without such oxidization, the eliminative organs remain impotent, disease and death resulting. These eliminative organs are the *lungs, liver, pancreas, kidneys* and *skin*, which I believe are in some manner assisted by the *spleen, red marrow of bones* and *thyroid*. Asphyxiation, on this theory, is an accumulation of non-oxidized chyle products.

In studying the functions of the individual organs, one must have constantly before his mental vision a living picture of the circulatory apparatus, the blood stream as it courses through it, and through each of these organs. The strongest argument I can present as proof of the oneness of the purpose of these organs, is the similarity of each of them in their relation to the circulatory apparatus and the blood stream.

The Lungs—The lungs *secrete* oxygen, and *excrete* carbon dioxide, water, ammonia, and some organic substances. What action they have on tissue-waste products it is difficult to tell, as we seem to know next to nothing about tissue-waste. My argument is that the lungs act on the blood before it reaches the tissues. I cannot understand an arrangement whereby an organ

is expected to permit the blood to pass through it and through the entire circulatory system, including the systemic lymphatics, before it performs its function. This is what our textbooks tell us, however, not only as regards the lungs, but the kidneys and skin, and it seems to me to be another evidence of a lack of symmetry in the structure of the organism.

The tissue-waste products, be it remembered, begin their existence outside the circulatory apparatus; although it is true we know very little of their nature, yet we do know something of the phenomena surrounding their existence; for instance, we know that there is no tissue-waste in the chyle when it leaves the alimentary lymphatics and enters the blood vessels; that before tissue-waste is found in the blood, the blood must pass through the circulatory apparatus and through the lymphatic vessels; it must follow the course I have described, so that originally it enters the lungs free of tissue-waste, and our textbooks say the lungs perform no function on the blood until it passes from the tissues.

The Kidneys—The great obstacle I have to overcome, or so it seems to me, in advancing the theory that the kidneys have an analogous function on the blood as have the liver and pancreas, is the fact that our textbooks have advanced a theory that has been accepted without reserve; so far it has never been questioned that their function is to remove tissue-waste products from the blood. My studies have led me to believe that we know very little of the nature of tissue-waste; that its secretion is entirely disproportionate to the excretion of urine, the excretion of urine being in much greater amount. I believe Dr. Carrel's experiments prove this, and I am impressed that his experiments of keeping alive tissues outside the organism proves, also, that oxygen is an injury instead of a benefit to the actual "upbuild" of the tissue medium.

The Liver—The great obstacle to overcome in attributing a similar function to the liver as to the kidneys, skin and lungs, is also the fact that our textbooks have given it a digestive function. Against this view I must call attention to the utter dis-

regard of mechanical principles such a function involves. The liver is as much a part of the circulatory apparatus as are the kidneys, certainly as much as the spleen or thyroid gland, or, if we were making general comparisons, as much a part of the circulatory apparatus as a ligament of a phalangeal joint is a part of the mechanism of a limb, and the only difference between the liver and the kidneys or the skin is the fact that the ducts of the liver open into the alimentary canal, whilst those of the kidneys and skin open into the outside world.

If we study its relation to the circulation in some detail, we find that the blood before it reaches the liver must first go to the heart, then to the lungs, then back to the heart and then to the liver. In addition to receiving arterial blood from the lungs, it drains the blood from the stomach, intestines, pancreas and spleen. This, it will be seen, draws upon the greater part of the blood, and the greater part of the circulatory apparatus, to produce bile. To me this constitutes a sufficient obstacle against accepting the liver as an organ of digestion. But worse follows. If bile is a digestive agent, especially if it is as important a digestive agent as is claimed for it, it is certainly essential for the production of blood. Without bile it would seem impossible to produce blood, yet without blood bile is impossible. Well might we ask, which came first?

In a certain sense, we know blood comes first, but it is not in a satisfying sense. The fœtus is nourished by the mother's blood, and this blood enters the fœtus before the bile, but unfortunately the bile in the fœtus is acknowledged to be an excretion. It seems strange that the same blood should produce a secretion in the mother and an excretion in the fœtus, and it seems even more strange that the food in the fœtus is cathartic to bile, and in the mother the bile is cathartic to the food. Colostrum, as we know, rids the new-born infant of the "meconium."

When we come to study the data on which our textbooks base their theory that bile is a secretion, we find this data very inadequate: "On proteids it produces no distinct action whatever, and in fact it would seem to interfere with the digestion of

proteids as begun in the stomach." "The principle function of the bile in digestion is the aid which it renders to the digestion and absorption of fats." To continue, bile is broken up, instead of acting like every other secretion, as one substance; only part of the bile digests, while the other part passes away with the *fæces*. This breaking up is a chemical breaking up, which means that it is not bile that digests, but some of its chemical constituents, just as though we said that water did not take part in the animal economy as water, but as its component parts, hydrogen digesting and oxygen passing away as an excretion. The fats which it digests are an unknown quantity; we do not as yet know how they benefit the system, or whether they are a benefit at all, or even if they are not an injury. The functions of the bile may be summed up by saying it is antiseptic, a stimulant to peristalsis, and an emulsifier of fats. We call them functions, but they are simply characteristics, and do not mean anything at all; certainly they do not prove it is a digestive agent. Bile might have all these characteristics, and be an injury instead of a benefit. It is not because gastric juice is an acid and contains a ferment that it digests, but it digests food and is an acid with a ferment; because ink is black, blue or red is not proof that we write with it; the coming of the blue bird does not bring the summer; because the gall bladder empties itself into the small intestine, when the stomach is full, is no proof that it empties itself to digest food more than to be itself digested by the food.

R. Meade Smith sums up a very exhaustive chapter on the subject of bile as follows: "The bile is, however, largely an excretion. Many of its constituents are removed unchanged, while some of them are reabsorbed and again enter the blood current. The mucin and cholesterin pass through with the *fæces* unchanged. The bile-pigments undergo decomposition in the intestinal tube, and are partly excreted with the *fæces* under the form of the hydro-bilirubin, a characteristic coloring matter of excrement, and are partly eliminated as urobilin by the urine. The bile salts are for the most part reabsorbed by the walls of the upper portion of the small intestine, only a small quantity of

glycocholic acid being found in the fæces. The taurocholic acid is largely absorbed, it being previously perhaps decomposed into cholic acid and taurin, the latter being constantly absorbed, while part of the cholic acid may perhaps be removed with the fæces."

The more I investigate the subject of bile, the less I see in the theory that claims it as a secretion, and I am more and more convinced that the theory was not born of knowledge accruing from investigation, but was accepted on trust. This trust has been handed down from the first investigators; they accepted it from ancient times, and every author has considered it as an article of faith ever since, as not a subject for investigation, but a conclusion into which every phenomena must fit or be erroneous. It seems like this: Bile was found in the intestine; this was proof that the ancient superstition as to its function was correct. It is pure assumption that because it mixes with food it must be of benefit, and, being present in large amount, it must be *very* beneficial. This error, or what appears to me to be an error, seems to be responsible for a large amount of the vagueness and ambiguity that exists in our textbooks.

Its clinical history is filled with contradictions also, as it must be when based on such contradictory conclusions as to its functions, whilst its treatment, if based on theory and not on practice, would border on the absurd. The symptoms of bile are vomiting, diarrhoea, nausea, headache (and a particularly distressing headache), complicated with still more distressing mental symptoms. These are the phenomena which too much of a good thing presents to the sufferer. Instead of ordering fats, we taboo them, and if we did not, the patient certainly would; instead, we order calomel, podophyllin and other cathartics to get rid of this good thing, and then we give tonics to bring it back, and failing, or imagining we have failed, we resort to bile itself, or rather to some of the bile acids, and while attempting to bring it back, we order a light diet so it will not be needed when it does come back. Unfortunately it always comes back, and we treat it as before; we never seem to learn by experience, and I do not think we ever will until we change our theory.

My conclusions are that bile (and what is true of the bile is practically true of the pancreas) is an excretion, and nature's method of expelling it (or them) from the system constitutes the one weak spot in an otherwise perfect organism.

Recapitulation—All the food that is not eventually changed into tissue medium is injurious to the system and must be removed, else it will destroy the organism. Fæces has for its analogue, carbon dioxide, ammonia, and some organic matter, urine, perspiration, bile and pancreatic fluid; the inferior part of the alimentary canal bears a similar relation to its superior part, as the circulatory apparatus does to the *Great Lymphatic System*; that peristalsis in the former is represented by the circulation in the latter; that the lungs, liver, pancreas, kidneys and skin bear the same relation to the blood as the large intestine, cæcum and rectum bear to the food; that as the mouth, stomach and small intestine are the individual factors in preparing solid food, so the lymphatic cells and glands are the individual factors in changing liquid food to the tissue medium; blood and chyle are composed of tissue medium, by-products and dead cells; the tissue medium is of benefit, the by-products and dead cells are injurious, and the organism is constructed to eliminate them; that its structure is in accordance with the highest mechanical principles, with a possible exception as to its method of eliminating bile and pancreatic fluid; that tissue-waste products, as yet, are an unknown quantity.

SPECIAL COURSE FOR LICENSED VETERINARIANS. — Dean Louis A. Klein, of the School of Veterinary Medicine, University of Pennsylvania, announces a special lecture and laboratory course extending over two weeks, beginning January 5, 1914. The course will be open to licensed veterinarians of Pennsylvania and other States. Those admitted to the course will be registered in the Dean's office, 39th street and Woodland avenue, Philadelphia, 9 a. m., January 5, 1914. Applications should be mailed before January 1, and the registration fee of \$5 should accompany the application.

CONTROLLING CHICKEN-POX, SORE HEAD OR CONTAGIOUS EPITHELIOMA BY VACCINATION.*

BY F. B. HADLEY AND B. A. BEACH, MADISON, WIS.

Introduction—During the winter of 1912-1913 there appeared among the poultry at the Wisconsin Agricultural Experiment Station an outbreak of chicken-pox, sore head or contagious epithelioma which progressed rapidly and bid fair to run through the fowls in all the pens. The disease greatly reduced the egg production, which is a matter of prime economic importance with every poultryman. Besides, infected birds lost vitality which they were very slow in recovering, and not infrequently death resulted. Steps were immediately taken to control the epizootic. The infected birds were given the ordinary treatment and quarantine measures were instituted; however, even with these precautions, but little headway was made, for new cases developed daily.

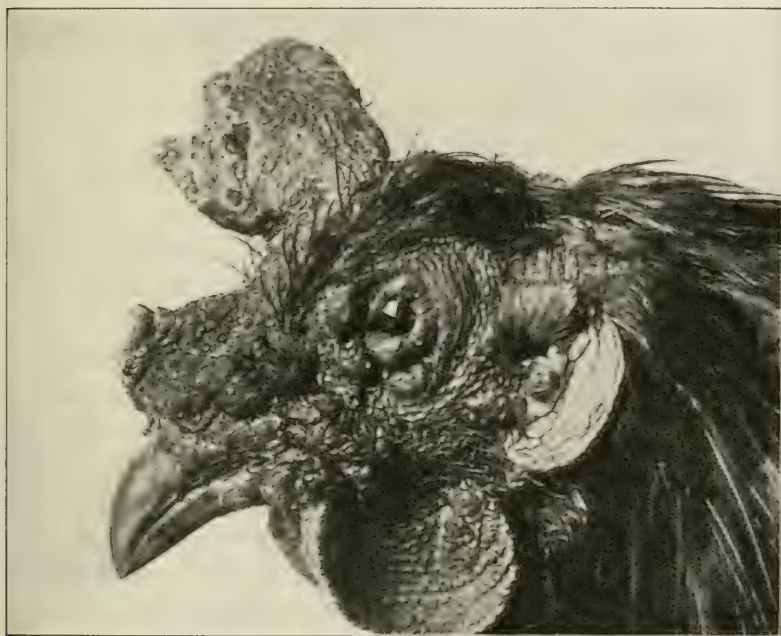
These disappointing results showed that the usual methods of treatment and disinfection would be ineffectual in controlling the outbreak, therefore an attempt was made to confer an immunity upon all fowls which did not show pock symptoms by injecting an autogenous vaccine. This treatment promises well and seems to have solved the problem of prevention and control.

While this work was in progress, several experiments were carried out and interesting results obtained which should be valuable to all poultrymen and veterinarians. This paper has been written to record our experimental results and to make available the technique of preparing the vaccine so that others may employ it if occasion arises.

* Presented to the fiftieth annual meeting of the American Veterinary Medical Association at New York, September, 1913.

The vaccine treatment is especially applicable in large commercial and experimental flocks, where the greatest losses are sustained and where preventive measures can be most economically carried out. Breeders of pure bred and fancy fowls whose stock would be impossible to replace should also find it valuable.

History and Occurrence—Chicken-pox has been known in this country since poultry raising became extensive enough to



be termed an industry. For how long before this we are not in a position to state, but presumably the disease has existed for many years in the southern states, where it is often rapidly fatal and assumes a very important place in the list of poultry diseases.

This disease has been particularly prevalent in Wisconsin during the past year. Early in October, 1912, several small poultry raisers in and about Madison sent hens which were sick, and others which had died from unidentified diseases, to the Agricultural College for detailed examination. A diagnosis of chicken-pox was made in several cases, from sections quite widely

separated, before the outbreak occurred in the university flocks. Chicken-pox was recognized by Professor J. G. Halpin of the Poultry Husbandry Department among fowls on exhibition at several midwinter poultry shows. He also states that the disease made its appearance in various flocks in Michigan during the winter of 1907.

Various investigators have studied this and related fowl diseases. Among the publications in American literature may be mentioned those by Ward,(1) Carey,(2) Kingsley,(3) and Haring and Kofoed.(4)

Cause—There is yet considerable doubt as to the exact cause of chicken-pox. Marx and Sticker (5) and others state that a filterable virus is the causative factor. In the beginning of the disease the blood has been said to contain the virus. Our experiments to support these inferences resulted negatively, but were limited in number and for comparative purposes must be judged accordingly.

Pox material was used by Lipschutz(6) to seed culture media with the hope that some specific organism could be isolated, but his results were not positive. Carey failed to reproduce typical sore head lesions in chickens inoculated with various organisms isolated from infectious material. Dr. O. V. Brumley of the Ohio State University has succeeded in recovering an organism or organisms from roup-infected fowls which he states will produce an immunity against roup in susceptible birds when used as a vaccine.

Much careful work has been done within recent years in an attempt to demonstrate that chicken-pox and roup are due to the same virus. Prominent among the men who have investigated this phase of the subject are Uhlenhuth and Manteufel,(7) who have contributed much valuable data to the pathology of both diseases. Schmidt(8) and Sigwart(9) have also discovered and reported interesting details.

In view of our knowledge relative to glanders and farcy, it is certainly logical to presume that chicken-pox and roup are the same disease manifesting itself in different forms. However,

differences of opinion exist among investigators on this question. Those who maintain that these are two distinct diseases think both may be present at the same time.

Pathogenicity and Transmission—Fowls show a varying susceptibility to chicken-pox, depending upon the individual and the virulence of the virus. We have been repeatedly successful in transmitting the disease by subcutaneous inoculations with a few drops of a normal saline emulsion of the virus made by freely macerating comb and wattle tissue from birds showing well-marked lesions of sore head. It is not possible, however, to reproduce the lesions by this method every time. Sometimes apparently susceptible hens inoculated as above fail to react, and control birds do not develop noticeable symptoms. This is not to be wondered at when the nature of fowls as a class is considered together with the peculiarities shown by the infection.

The incubation period varied from three to twenty days in our experimental cases. Diphtheritic membranes frequently appeared on the nasal, oral and conjunctival surfaces when the diluted virus was instilled onto them or inoculated subcutaneously.

Microscopic examination of involved epithelium from the comb showed an increase in the size of the epithelial cells which appeared to contain inclusions, and inflammatory changes in the deeper layers.

In commenting upon the significance of the various organisms which different authors have isolated from pox and roup infested fowls, Hutyra and Marek (10) have the following to say:

“The many conflicting results secured by different investigators render it improbable to attribute any specific rôle to the organisms isolated; but, on the other hand, when one takes into consideration the positive inoculation results secured with isolated pure cultures, the possibility still remains that under such special circumstances, namely, when the conditions for their multiplication in the body of the fowl are all favorable, they can occasion local diphtheritic inflammatory changes, or can less frequently produce well-defined lesions of a similar character. If one now considers the fact that the disease of the mucous

membrane can be induced by filtrates from the disease products and also by intravenous injection of such filtrates, one cannot reject the assumption that fowl diphtheria, as well as chicken-pox, is produced primarily by the same filterable virus subsequently to which facultative pathogenic bacteria attack the mucous membrane and contribute more or less to the development of the clinical picture of the disease."

Symptoms, Prognosis and Immunity—It does not seem necessary to discuss at length the symptoms of chicken-pox. Reference may be had to textbooks and the literature recited at the end of this article for details. Suffice it to say that our observations agree with the statement made by Pearl (11) that as long as the disease is confined to the skin of the head the general health of the bird is unaffected, and in most cases egg production is not interfered with. On the other hand, just as soon as noticeable lesions appear upon the mucous membranes the hens stop laying.

The recovery of this important function depends upon the individual, and the extent to which the mucosæ are involved. In some instances, not more than ten days will elapse before eggs are laid again; in other cases months may pass before the bird returns to her normal state. Emaciation in this class of cases is rapid.

A quotation from Salmon (12) substantiates our observations and experimental results and is therefore given: "In the most violent cases, especially with pigeons, the eruption extends to the mucous membranes of the mouth and nostril, the resulting inflammation taking on a diphtheritic form, and early death follows."

In the northern states, where the trouble usually occurs in the late fall and winter months, the prospect for recovery is good unless complications develop. The mortality is not great and depends to a large extent upon the condition of the birds when attacked, and the care and treatment subsequently given. Where a progressive form of the disease involving the mucous membranes occurs, fatalities are more numerous. Blindness results when the conjunctival tissue is extensively involved. This

makes it impossible for the birds to see food, and death soon follows. Carey found that affected birds may recover in two to eight weeks. He states that with good care and treatment 90 per cent. should recover, but if left to themselves 50 per cent. may die.

One severe attack is said to confer a permanent immunity. A mild attack gives but a temporary protection. It is too early to state with any degree of accuracy how effective is the immunity rendered by our vaccinations. However, the results reported by Manteufel(13) lead us to believe that it will last from one and one-half to two years.

Treatment—The vaccine treatment and prevention of contagious epithelium was first suggested and tried by Manteufel. He also found that serum from hyperimmunized fowls did not have a preventive or curative effect.

Our results with autogenous vaccines have been very encouraging, as the experiments detailed below show. It is advisable to supplement the vaccination with local treatment, especially where the typical white coating appears on the nasal, oral or conjunctival mucous membranes. A small curette has given excellent service in removing the diphtheritic membranes and accumulated pus, which cause serious trouble if not removed. The resulting raw surface is then gently swabbed with a 5 per cent. solution of potassium permanganate.

EXPERIMENTS WITH CHICKEN-POX.

I.—*Vaccination Experiments.* The vaccine used in these experiments was prepared by employing pock scabs from the skin, and diphtheritic membranes from the nasal, oral and conjunctival mucosæ. Infectious material was ground in a sterile mortar with physiological salt solution. It was then filtered through absorbent cotton and heated in a water bath for one hour at 55° C. No definite standard has been set for estimating the quantity of virus contained in a given amount of vaccine prepared as above. Variations will occur due to the character of the material used; experience will teach the strength most suitable for use.

No. 1. *Vaccine Treatment of Infected Fowls*.—Two pens containing 60 hens which had been removed from various other pens and isolated because they showed symptoms of chicken-pox were included in this experiment. Forty of these fowls were injected subcutaneously with 1 c.c. of the vaccine; the others were left for controls. The treatment seemed to have a decidedly beneficial effect, for recovery was much more rapid than in the unvaccinated controls. The disease in the latter ran a longer and more severe course.

No. 2. *Vaccine Treatment of Pox-Free Fowls*.—The fowls, numbering about 440 in 22 pens, were vaccinated with two doses at an interval of 5 days. Only 4 hens in this lot developed clinical symptoms sufficient to attract notice. It seems probable that one or more of the four was infected at the time the treatment was given. This shows conclusively the efficacy of the treatment, for less than 1 per cent. of the vaccinated fowls subsequently developed chicken-pox.

No. 3. *Control Experiment on Vaccine*.—Seventy-five white leghorns in three pens were left untreated as controls for three weeks after the disease made its appearance in these pens. At the end of this time twenty-six cases had developed, while treated fowls in other pens were protected 99 times out of 100. All birds then well were vaccinated to prevent the disease from spreading further among these birds, for they were valuable breeding stock.

No. 4. *Experiment with Small Doses of Vaccine*.—In this experiment seven hens were used. Five were given but 0.5 c.c. of a vaccine which had been prepared by inactivating for only one-half hour at 55° C.; two were left as controls, of which one developed a mild conjunctival infection after four days. All others failed to show lesions even though kept in an infected pen.

II.—INOCULATION EXPERIMENTS.

An endeavor was made by these experiments to demonstrate the virulence of the virus and the effectiveness of the vaccine.

No. 1. *Inoculations by Feeding the Virus*.—Three susceptible and two immune hens—one through natural infection and

recovery and one through vaccination—were fed 5 c.c. of virus emulsion by passing a tube down the œsophagus. Two of the first mentioned developed mild lesions on the oral and nasal mucosæ, and cutaneous lesions on the head, but later recovered. The third susceptible remained apparently normal, as did the “recovered” immune. A small patch appeared after three days on the tongue of the vaccinated hen, but nothing further abnormal was noted and she made a speedy recovery. Both immunes failed to develop the disease.

No. 2. *Inoculations by Introducing Virus Through the Epithelium.*—Five hens, three susceptible and two immune, as were those in the above experiment, were used to demonstrate the results of scarifying the comb and wattles and injecting the virus. All the susceptibles developed typical cases from which recovery was extremely slow. The “recovered” immune showed no lesions whatever, while the vaccinated hen developed a slight catarrhal conjunctivitis five days after having been infected, which soon disappeared.

No. 3. *Inoculations by Instilling the Virus Into the Conjunctiva.*—Four susceptible and one naturally immune hen were infected by instilling infectious fluid into the conjunctival sac. Of the susceptibles, three developed serious eye, nasal and oral lesions, from which they recovered, but the fourth only showed evidence of the disease by a slight throat inflammation which developed after six weeks and was probably secondary. The immune control remained normal.

No. 4. *Inoculations by Instilling the Virus Into the Nostrils.*—This experiment included six hens and was carried out by instilling virus into the nostrils. Three had been artificially immunized by vaccination and developed no lesions as a result of the infection. The other three were susceptible to chicken-pox and showed clinical symptoms in the throat in three, five and ten days respectively. All eventually recovered, but one was markedly emaciated even after two months.

No. 5. *Inoculation by Injecting Blood from an Infected Hen.*—One susceptible hen was injected subcutaneously with 2 c.c. of blood from an infected hen. Results were negative.

No. 6. *Inoculation by Injecting Pus Subcutaneously*.—One susceptible hen received subcutaneously 1 c.c. of purulent material from hens sick with chicken-pox. This bird died suddenly after seventeen days from asphyxiation. Autopsy revealed a mass of pus which completely occluded the entrance to the trachea.

No. 7. *Natural Infection Observations*.—(a) A game cockerel, susceptible to chicken-pox, was placed in the fattening shed, where the infection had previously appeared, with other roosters which had been vaccinated and were immune. Scratches on the head from fighting became infected and the bird developed a well marked case, including mouth and throat lesions, from which he died on the twentieth day.

(b) A white rock cockerel which had never been vaccinated was placed with treated hens in an infected colony house. He developed a typical case, both comb and mouth symptoms, but finally recovered. None of the hens became infected.

III.—FILTRATION EXPERIMENTS WITH VIRUS.

In this work Chamberlain filters were used to filter the salt-emulsion-virus, which had been prepared in a manner similar to that used in the previously recorded experiments. All bacteria were excluded, as was shown by microscopic and cultural tests of the filtrate.

Experiment No. 1.—In this experiment eight non-immune hens were employed. They were divided into two lots of four each. One lot was isolated and infected with the filtrate by instilling it into the eyes, nose and mouth. The other hens were used as controls and similarly inoculated with the unfiltered virus. No lesions developed in the hens given the filtrate. One hen in the other lot had a mild attack after two weeks, the symptoms being confined chiefly to one eye.

Experiment No. 2. Six susceptible hens were employed. Three were given instillations of the filtrate into the eyes, nose and mouth. The other three were used as controls and inoculated with the unfiltered material. The experiments turned out unfortunately, for none of the hens developed lesions.

These experiments with filtered virus are limited and by themselves fail to demonstrate that chicken-pox is caused by a filterable virus, because the controls did not develop typical lesions. Possibly the hens had considerable immunity as they were all from one source. Further work along this line is planned and duplicate experiments will be carried out soon.

CONCLUSIONS.

1. An autogenous vaccine has proved successful for treatment and prevention of chicken-pox. But results were obtained by two doses. The vaccine is especially applicable in large commercial and valuable breeding flocks when used before pathological changes become marked.

2. The vaccination treatment for chicken-pox was most valuable when used as a preventive, where it was effective in fully 98 per cent. of the cases.

3. One attack conferred immunity. The immunity which resulted from the vaccination is estimated to be effective for one and one-half to two years.

4. It was found impossible to transmit the disease at every attempt, due to certain peculiarities of the virus and the fowls. When the attempts were successful, the disease ran a benign course; as it also did in the few cases in which it made an appearance after vaccination.

5. Experiments to show that chicken-pox is caused by a filterable virus resulted negatively.

6. Although the identity of chicken-pox and roup has not been definitely proved, the similarity of these diseases is so great that it seems possible to control roup by vaccination.

LITERATURE.

1. Ward, Proc. A. V. M. A., 1904.
2. Carey, Ala. Agric. Exp. Sta. Bull. 136, 1906.
3. Kinsley, AMERICAN VETERINARY REVIEW, 1907. XXX.
4. Haring and Kofoed, Proc. A. V. M. A., 1911.
5. Marx and Sticker, Deut. Med. Wochen., 1902-3 (quoted by Hutyra and Marek).
6. Lipschutz, Central. f. Bakteriöl., 1908, XLVI.
7. Uhlenhuth and Manteufel, Arb. a. d. Kais. Gesundheitsamte, 1909, XXX.
8. Schmidt, Central. f. Bakteriöl., 1909, LII.
9. Sigwart, Central. f. Bakteriöl., 1910; abs. in Exp. Sta. Rec., 1911.
11. Hutyra and Marek, Spez. Path. und Therapie d. Haustiere.
11. Pearl, Surface and Curtis, Me. Agric. Exp. Sta. Bull., 1911.
12. Salmon, Diseases of Poultry, p. 194.
13. Manteufel, Arb. a. d. Kais. Gesundheitsamte, 1909, XXX.

PHYSIOLOGIC PRINCIPLES IN THERAPEUTICS.*

BY PIERRE A. FISH, ITHACA, N. Y.

The comparatively recent use of more exact scientific methods in clinical work has brought about a much closer relationship between physiology and practical medicine.

In the ultimate analysis the majority of diseases can be traced to a disordered condition of metabolism or tissue change. In some instances the disease may arise from disordered digestive processes or the production of substances more or less toxic which interfere chemically with normal metabolism. In other cases it may be due to the invasion of a foreign organism or a substance produced by it, as in tuberculosis or tetanus.

Recent physiologic research shows that there is an intimate chemical relationship between certain portions of the body with others and that, in all probability, there is more or less chemical relationship between all parts.

Since the time of Sir Charles Bell it has been maintained that the normal functions of the body are carried out through the nervous mechanism; that certain parts apparently more or less isolated are all under nervous control. Starling and Bayliss have shown by their discovery of the hormone secretin, in the mucosa of the intestine, that the chemical relationship is quite as important as the nervous in the digestive processes. The recognition of the chemical factor in regulating and controlling certain of the bodily functions is being extended. The active principles or hormones of the internal secretions of certain of the ductless glands produce their effects in a chemical way and their importance is shown by the fact that serious results follow their removal.

* Presented to the fiftieth annual meeting of the American Veterinary Medical Association at New York, September, 1913.

The use of drugs in the treatment of disease is founded upon the belief that they may chemically influence certain functions of the body. Such a belief seems rational when evidence is accumulating to show that the body itself is able to produce chemical substances with which to regulate or modify its various functions. It is, furthermore, reasonable to use for therapeutic purposes those agents which enable the body, when in health, to perform its functions normally.

The importance of the nervous factor in physiologic processes is by no means lessened, but the honors heretofore accorded to it must in many instances be shared with the chemical factor. In primitive conditions, and because in the sequence of development the nervous tissue is relatively late in its appearance, the chemical factor assumes still greater importance. The results produced by the excitation of protoplasm follow chemical changes whether the stimuli be of chemical origin or not, and the reaction is relatively slower than that produced by the nervous factor in later development.

The nervous and chemical factors are not antagonistic but co-operate harmoniously in the work that is to be performed. An example of this co-operation is well shown in the production of the digestive juices. The salivary secretion may be induced through the nervous mechanism before the food has actually entered the mouth. Although the taste of the food may initiate the flow of the gastric juice, its continuance is effected by chemical stimuli derived from the pyloric secretion. The production of pancreatic juice, according to recent investigations, seems to be due entirely to the chemical stimuli furnished by the secretion formed by the mucosa of the duodenum. A series of events has therefore taken place originating in the nervous mechanism and merging into a chain of chemical reactions which do not antagonize but supplement the nervous activity.

In the consideration of the normal and diseased conditions it is of great importance not to overlook what might be termed the internal work of the body or those activities which are essential for mere existence. The vital activities centre largely

around the heart and the work it can do. Under normal conditions the energy required to drive the blood, loaded with nourishment, to the tissues, and the amount of waste products poured back into the blood by the tissues, represents many foot-tons of work during the twenty-four hours. If the action of the heart or circulation be interfered with by disease the work is proportionately increased until a condition may arrive when the heart is unable to support any further work from external sources and the patient must submit to a life of inactivity until finally the internal work of existence is overcome. Similarly in regard to the work done by the muscles of respiration in enlarging the diameters of the chest in order that the blood may be properly oxygenated. Normally, the work is considerable, but if interfered with by pathologic conditions, the daily output of energy is greatly increased.

Undoubtedly the greatest item in internal work is the production of heat. The normal work of the heart and respiratory muscles involves the liberation, as a by-product, of more than twice as much energy in the form of heat as is actually required for the mechanical work of the circulation and respiration. All living cells, from their chemical changes, contribute to the production of heat. If the cells excrete temperature as a by-product of their activity, it will follow that cells unduly active will produce a greater amount of temperature, and if prolonged will result in fever; whereas cells of a low degree of vitality would produce less heat and represent a smaller expenditure of energy. As long as a cell is alive it performs the duties of metabolism and produces more or less heat. The duration of life and the various types of temperament are probably referable to metabolism. With a nervous and excitable temperament and a life period perhaps below the average, we may associate cells with rapid metabolic processes; with a mild and phlegmatic temperament and a life period beyond the average, we may assume that a greater economy exists in the metabolism of the cells and their normal processes continue for a longer period.

Life and heat are inseparable. If the temperature of the

blood rises, tissue waste must be increased. Fever, therefore, tends to have a destructive effect upon the cells, whether it be primarily due to an increased production of heat, to a diminution of loss of heat, or to a disturbance of the normal balance between the two. If it is desired to lower the temperature in fever, the easiest method is to increase the amount of heat loss, because this is more under our control than heat production. Cold baths, for instance, act by removing heat from the body surface by conduction; sudorifics, by increasing evaporation. Our knowledge of the drugs which diminish the amount of heat production is limited. Alcohol, in large doses, appears to do so, probably from its paralyzing effect upon the cells. Quinine, in retarding the metabolism of the cells, seems to have a similar action. Some antipyretics appear to increase the loss of heat by dilating the superficial blood vessels and so increasing the amount of radiation from the body; while some others appear to have some action upon the heat-regulating centres which have more or less control of the heat-regulating mechanism.

Although the energy of the body is derived from the food, not all of the energy inherent in the food is available for metabolism. Some of this energy is utilized during the digestive processes in preparing the food for absorption and assimilation. It has been calculated in the case of a horse fed entirely upon hay that 48 per cent. of the energy of the food is expended in its digestion and absorption. There is also a variation according to the chemical constitution of the food. Proteins seem to demand more energy, carbohydrates less, and fats still less. Milk, the common food of all animals in their infancy, requires the least digestive work. During the period of infancy the digestive enzymes have not reached their full period of development, and although able to digest milk for tissue use, they are unable to act upon the more concentrated foods in a satisfactory manner.

Carbohydrates and fats furnish the greatest amount of energy to the body. Protein may intermittently or accidentally contribute to the energy produced, but its chief function is to replace the nitrogenous material in the tissues. Under certain conditions

a greater amount of protein may be retained in the body; this is exemplified in pregnancy, where it is utilized to contribute to the formation of the fœtus and the increased growth or hypertrophy of the uterus and mammary glands. Likewise in convalescence from acute diseases where wasting has occurred, the tissues possess the property of retaining a larger amount of protein, in order that the normal weight and size may be regained at a relatively rapid rate.

In the body, carbohydrates are converted into sugar and a portion of the sugar may be converted into fat. Clinically there is some evidence that there are cases where the conversion of carbohydrate into fat is not well developed, and as a result of the imperfect assimilation pathologic changes may occur. In some cases of glycosuria in elderly subjects the question has arisen if the condition may not be due to the sugar passing away through the kidneys instead of contributing to the formation of fat; in other words, the patient is a diabetic because he has not laid on fat.

The control of the size of the blood vessels by means of the vaso-motor nerves has a direct bearing upon the conditions of engorgement and congestion. At the present time the balance of evidence is opposed to the view that the pulmonary blood vessels are supplied with vaso-motor nerves. This, perhaps, accounts for the ease with which these vessels become the seat of passive engorgement when there is any obstacle to the outflow of blood into the left heart. In this way the lungs may serve as a reservoir for the pulmonary circulation in much the same way as the liver and spleen serve in a similar capacity for the systemic circulation. A condition of passive congestion, therefore, plays a large part in pulmonary diseases. During the expansion of the lungs in inspiration the pulmonary capillaries are increased in calibre and the circulation through the lung is facilitated. During expiration, on the other hand, the vessels are diminished in size and the circulation is more difficult. This is one reason why a patient whose pulmonary circulation is interfered with tends instinctively to keep the chest as much as possible in the position of inspiration. The absence of a vaso-

constructor supply to the pulmonary arteries also implies that adrenalin (which acts on the terminals of such nerves) can be of no use in checking hemorrhage from the lungs.

The bronchial artery supplies the pulmonary pleura, and the internal mammary and intercostals the parietal pleura, while the venous blood is carried away from these parts by the azygous veins. These veins are imperfectly supplied with valves; therefore, when the pressure in the right heart is raised, the venous roots in the pleura become quite readily congested and effusion or hydrothorax results. The vessels in the pleura differ from the pulmonary vessels in that they are supplied with vaso-constrictor nerves. They are, therefore, more susceptible to the action of adrenalin, and advantage has been taken of this fact in the treatment of pleural effusions.

The blood normally varies considerably in the proportion of its constituents. A diminution in the amount of its fluid causes greater concentration, an excess of red corpuscles and an increased viscosity. Gustave Mann has calculated that the maximum number of corpuscles which the human blood is capable of holding is 13.9 millions. A blood count of 12,000,000 must imply a very great increase in the circulation time through the capillaries. Anything which increases the stay of the blood in the capillaries permits of the abstraction of a greater amount of oxygen from it and therefore contributes very materially to the production of cyanosis.

It is becoming more and more evident that no single organ lives unto itself alone, but that the chemical changes which take place in each may be of great importance to metabolism as a whole and to the normal interchange in other organs. Although the chemical products of every organ must influence the conditions of the body to some extent, it is only when the influence is specific and the origin definite that the substance is entitled to designation as a hormone—a substance which excites chemically.

Aside from nutritive material there are, according to Ehrlich, two groups of substances which affect the body. The first group—the toxins—are closely allied in their chemical character to the proteins and are produced through the agency of living

organisms. As a result of their introduction, the tissues react by the development of an antibody. The second group includes all of the common drugs, which probably act upon the protoplasm because of their molecular arrangement, producing their effect upon the cells quickly and without a period of incubation. Although repeated doses may, in some cases, set up a certain degree of tolerance, an antibody is not produced. Hormones may be assumed to belong to the second group, because if they produced antibodies, larger and larger doses would be required to perform their physiologic functions and this would defeat their own object. Hormones may therefore be regarded as belonging to the permanent, and not to the acquired, defenses of the body.

According to Langdon Brown, the general features of hormones may be stated as follows: (1) They are bodies of comparatively small molecular weight; (2) unlike ferments, they are not destroyed by simple heating, but may lose power on prolonged boiling; (3) they are rapidly destroyed by oxidizing agents; (4) they are destroyed in the tissues which they excite and do not escape in any of the excretions; (5) they are not, as a rule, absorbed unaltered from the alimentary canal. Iodothyryin, the active principle of thyroid extract, is an exception to this rule, probably because the thyroid gland originally discharged its secretion into the alimentary canal by the thyro-glossal duct.

In a practical way, it would appear that typical hormones should be employed only by local application or injection; since they can be added to boiling water without loss of strength, the question of sterilization is much simplified; that as they disappear, probably by oxidation in the tissue they excite, they are more useful in producing temporary rather than prolonged effects. The following table modified from Starling gives the more commonly recognized hormones:

Origin.	Hormone.	Reacting Organ.
Suprarenals.....	Adrenalin	Sympathetic nervous system.
Stomach (pylorus)...	Gastric secretin....	Stomach (fundus).
Duodenum	Secretin	Pancreas, Liver.
Thyroid	Iodothyryin	Nervous System, Skin, etc.
Ovaries .....	.....	Uterine mucosa.
Fetus .....	.....	Mammary gland.
Gastric Mucosa	Hormonal	Intestinal musculature.

Adrenalin is a chemical body whose presence is apparently essential to the activity of the sympathetic nervous system. Langley has made the important generalization that the action of adrenalin on any part is the same as stimulation of the sympathetic nerves to that part. This is of especial interest in view of its formation by a structure of sympathetic origin. The most striking action of adrenalin is the rise of blood pressure resulting in part from the constriction of the vessels. This effect is not common when taken by the mouth, probably because its absorption is largely prevented by the vaso-constrictor effect upon the vessels of the gastric mucosa. For this reason it has been used successfully in checking hemorrhage from the stomach, and for the relief of vomiting. Its action upon the stomach would also suggest its use for hemorrhage of the intestines. It has apparently been so used with some success, but the fact that adrenalin, like the sympathetic, checks peristalsis and tends to close the sphincter muscles, makes it somewhat doubtful if it can get by the pylorus. Exner has found that the intraperitoneal injection of adrenalin delays the absorption of a poison introduced into the stomach or peritoneal cavity; thus strychnine required twenty times as long to produce its toxic effect. This gain of time is most valuable, and suggests the administration of a full dose of adrenalin pending the use of other remedies.

In addition to its vaso-constrictor effects, adrenalin is a powerful stimulant to the heart, augmenting its action like the sympathetic, but intravenous injections must be used to produce this action. In azoturia, "heart failure" may occur as the result of the production of toxic substances in the tissues; with this condition it is not unlikely that vaso-motor paralysis prevails and the use of adrenalin should be of benefit in raising the blood pressure as well as stimulating the heart. Occasional reports of the successful use of adrenalin in this affection may, perhaps, be explainable on this basis.

Accepting the general view, that vaso-motor nerves are absent from the pulmonary and cerebral vessels, adrenalin would be contra-indicated in the treatment of hemorrhages from these

parts, because its action in constricting vessels elsewhere would cause an increased flow of blood to these areas and thus aggregate the hemorrhage. The tendency of the blood to collect in those areas which are not supplied with vaso-motor nerves following the intravenous use of adrenalin, should be kept in mind especially if those areas are diseased.

The first and most conspicuous triumph for organo-therapy was treatment by thyroid extract. From its great success in myxoedema and cretinism, iodothylin may be regarded as a hormone having a specific action on the central nervous system and on the skin and subcutaneous tissue. The effect of thyro-iodin on metabolism is to reduce weight, only one-sixth of the loss being due to increased nitrogenous waste, the remainder being due simply to the diuresis it causes, apparently by dehydration of fats.

One of the more recently described hormones* still in the experimental stage has been designated hormonal. It is found in the gastric mucosa of all animals thus far examined at the time when the digestive process is at its highest, but it is obtained in sufficient quantity only in the spleen. It is suggested that the gastric mucosa produces this hormone and the spleen stores it up. When injected intravenously or intramuscularly, it produces an energetic wave of peristalsis beginning at the pylorus and passing throughout the length of the intestine. Therapeutically it has been recommended in cases of chronic constipation and acute intestinal paresis. Its injection is usually followed by a transitory rise of temperature. It may be distinguished from cathartics in that it causes intestinal peristalsis comparable to the physiologic process and, in those cases which respond, its action is said to be of some permanency or at least of long duration.

In general, organo-therapy or hormone treatment may be considered in suitable cases to be more specific than drug treatment, in that it inaugurates or maintains conditions very similar, if not identical, with the normal physiologic processes. As drugs

* Dohr, Marxer and Zuelzer, *Berliner klinische Wochenschrift*, 1908, No. 46.

have active principles of much therapeutic value, so physiologic research is demonstrating that in hormones, certain, if not all, of the organs of the body have also their active principles which act upon body areas more or less distant, and in a few instances have shown great therapeutic usefulness. With continued research it is probable that our knowledge of the hormones and their use in therapeutics will be greatly extended and the bonds uniting physiology with medicine will be knit still more closely in the future.

THE NATIONAL HORSE SHOW OF AMERICA had a very successful season at the Madison Square Garden, New York, the third week in November. The old garden never looked better, and probably never housed a better lot of equine aristocrats. The saddle and heavy harness classes seemed to hold the interest of the railbirds (the real enthusiasts of the show) closer than any others, unless perhaps the high jumpers. This association is surely a great stimulus to breed good ones, for only very good ones can get a look in at the prizes. The championship contest for saddle horses on the last afternoon brought together the *creme de la creme*, and this class (mostly mares) showed some beautiful types. The heavy harness horses brought together in the ring in the championship contest, represented the finest in this country, possibly in the world, and made one's heart bound at the thought of again seeing our parks teeming with them as in the past. An especially inspiring feature of the show during the past few years is the race between coach teams for the Arrowhead Inn Challenge Cup. The cup this year was won by Mr. Emil Seelig, of New York, whose lusty four-in-hand consisting of Big Tim, Flying Gyp, Montclair and Tenaflly, made the run from the Inn to the Garden, a distance of nine and a half miles right through the heart of the City, in thirty-six and a half minutes. His competitor had one or two mishaps, such as a horse falling, a broken poll-chain, etc., and reached the Garden twenty minutes later. These imposing outfits, with a cock horse trailing, made the automobiles along the route appear very insignificant by comparison.

DR. C. E. KORD, Terre Haute Veterinary College, '12, has recently located in Pulaski, Tennessee.

VETERINARY SCIENCE FROM A COUNTRY PRACTITIONER'S VIEWPOINT.*

BY J. F. DeVINE, GOSHEN, N. Y.

At this time when mechanical devices are supplanting in so many ways the various duties that we previously asked our domestic animals to perform, the general aspect to the veterinary practitioner must necessarily be somewhat changed. This is particularly so with the class of men who have chosen the city as a place of practice. It is needless to attempt to enumerate all that the steam and electric railways and the automobile have done to supplant equine service in certain localities.

It seems but yesterday that the one subject that received most attention in the veterinary schools was the horse, and young men were wont to flock to cities where wealth made it possible to receive large fees, particularly in districts where the high-class carriage horse, the thoroughbred and the gentleman's roadster or trotter abounded. The owners of these animals were usually men of much wealth and were willing to pay liberally for skillful attention given to their animals. Those who have had experience in large city practices know full well that a veterinarian a decade ago might have been an equine specialist and carried on a lucrative practice in cities where his work consisted largely of examinations for soundness, lameness, green sickness, pulmonary affections and injured feet. Times have changed. The lavish expenditure upon the equine idol at such places as Saratoga and Sheepshead Bay in New York State, and similar places in many other states, is but a thing of memory. The heavy harness horse is now replaced by the limousine automobile; the electric auto and lighter cars are transporting and taking up the attention of the people who formerly were admirers and drivers of the lighter road horse; auto trucks are supplanting the draft horse, and it

* Presented at the meeting of the A. V. M. A., held in New York City, September, 1913.

is plain to see that the future veterinarian must be capable of taking a more active part in agricultural and municipal matters, such as meat and milk inspection, and in general sanitary control work, with view of guarding against the transmissibility to the human family of communicable diseases and the prevention and suppression of animal plagues the ravages of which, if allowed to take their course, would in all probability soon shatter the very foundation of that important factor of our nation's wealth, the livestock industry.

In agricultural matters the veterinary practitioner to-day must not only be a practical horseman but he must meet the requirements of a broader term. He must be a practical stockman. His training should be so broad that his advice will be sought on feeding and dairying problems. He should be able to advise his rural clients as to the proper type of animals for breeding purposes, the proper nourishment for growing the young, or balanced rations for the greatest production in the adult. He should likewise be able to discuss intelligently such matters as rotation of crops, their relative nutritive value, etc.

Allowing that the horse is still possibly the most important factor to the general practitioner, we will need to wend our ways ruralward if we are to continue to attend to his needs. Statistics show that there are approximately twenty-four million horses in the United States to-day and that about three-fourths of them are on the farms.

Lest it would appear from what I have said that the day of the horse's usefulness has past and its value become unworthy of attention, let me remind you that perhaps there never has been a time in the history of our country when its value was greater, or its services more in demand.

While the evolution which we have cited has been going on new avenues of occupation have been added to some of the old. While the price of trotter and the show horse is to-day, as in the past, governed largely by the quality of the individual and the wealth of the purchaser, the price of the draft horse and the general utility horse have steadily advanced. This has been

augmented in a measure by the lack of supply of horses of a satisfactory type and quality, when horse breeding became unprofitable several years ago. Here, again, is where the veterinarian should be the guiding star of the breeder, and here is where proper stallion registration laws, at this time when horse breeding is sure to revive, would be of inestimable value to our country.

We as veterinarians should point out to the breeder the absolute necessity of selecting sires not only of a desirable strain but of a desirable individuality. Using a sire simply because he is eligible to registration, or possibly is registered, reminds me of an expression of a breeder of Holstein cattle. He said that some people in selecting a bull to head their herd would lay great stress upon getting a registered animal and that ordinarily that was about all that some of them did get. And added, "that some of the registered sires ought to have a certificate of burial rather than a certificate of registration."

The same holds good with our horse breeding; we want good blood lines and we want good individuals. In fact, a pure bred defective animal is more dangerous than a scrub, as he is far more apt to be prepotent and stamp his offspring with his defects. It is our plain duty, so far as we can, to assist in discouraging the breeding of animals with naturally vicious dispositions, particularly females; likewise animals of faulty conformation such as narrow chests, long, washy barrels, defective feet, curby or beefy hocks or those suffering with hereditary spavins, ringbones and like unsoundnesses.

With the ever-increasing population of our cities and the systematizing of municipal governments, two comparatively new necessities have been added to the calling of the veterinary profession, namely, state and municipal meat and milk inspection.

The necessity and advantages of state and municipal meat inspection is daily receiving more and more attention. The public are beginning to grasp the fact that Federal inspection, even with all its splendid system and force, looks after only about 60 per cent. of the meat consumed by us, and that the greater

part of this so inspected is for the protection of the other fellow and not for the small consumer, who is at the mercy of the unscrupulous local butcher who may slaughter an animal suffering with any such dangerous or disgusting diseases as advanced tuberculosis, cancerous organs or extensive suppurative areas or the like. When after stripping the diseased parts the remainder of the carcass is sold to the helpless consumer. It is truly a blessing to mankind that it is usually customary to subject meats to some form of cooking before eating under such conditions.

State and municipal meat inspection, when conducted under capable veterinary supervision, should excel federal inspection, since in most cases it would be possible to carry out ante-mortem examination as well as post mortem.

Meat inspection is truly a noble service, and the truism, "He serves his own interests best who works for the common good of all," was never more applicable than in this work.

MILK INSPECTION.

In certain Eastern countries, where babies are usually nursed by their mothers somewhat longer than in this country and are weaned gradually upon farinaceous and miscellaneous diet, they get along very nicely without the use of milk; but we have learned to look upon cow's milk as a most useful food for adults and practically a necessity for infants, particularly among classes where breast feeding is becoming undesirable or impossible. The wonderful merits of milk can only be realized when we understand that it contains all the elements necessary for growth and development in the young, and that it is the only single article of food which is complete enough in itself to sustain life for a very long period.

While normal milk drawn from a healthy cow and properly cared for is so valuable, still we have learned to know that diphtheria, scarlet fever, typhoid fever, tuberculosis and other diseases may be spread by milk, and that stale warm and bacteria-laden milk is especially dangerous to young infants, and that some widespread epidemics which were formerly attributed to water,

air and other causes are now found to be due to milk. As a noted writer has well put it, to separate the mouth of the baby from the teat of the cow by several hundred miles is often a serious matter to the baby. Nature probably never intended the milk of one animal to be used by the young of another, but since it seems to have become a necessary custom with us, it has brought with it also the necessity of skilled supervision in order that it may be useful rather than harmful.

Cities are fast beginning to learn that even with their beautiful parks and boulevards, clean streets and similar ideal conditions, the health question is only half solved. No city can remain healthy unless it takes into account the health of the country from which it obtains its food supply. It is interesting to note that at one time there was much more disease and much higher death rate in the city than in the country. The tables have now been turned, for there is less chance of contracting infection in the well ordered city than in the average country place. For a long time people did not know how to live huddled together in large communities; fads and fancies ruled the day in matters hygienic; people partook of polluted water without a question. In fact it took them a long time to find out that the inexpressibly nasty habit of drinking water defiled with sewage was dangerous as well as not nice. To-day our larger cities have a fairly satisfactory and clean water supply and the removal of waste is steadily showing improvement, but they must still get their milk from the country, and in many instances hundreds of miles away. For instance, New York City uses about one million six hundred thousand quarts of milk daily, and in order that this river of milk may reach the consumer in a palatable and nutritious form, it must be carefully guarded from the cow to the mouth of the consumer. In carrying out this protection our object should also be to enlighten and educate and not frighten. There is a temptation on the part of the popular exponents of science toward overstatement. This is not necessary; we will find that when all indictments are brought together that milk is criminal enough without any exaggeration. The great difference between milk

and most other fluids, in that bacteria tend to grow well in milk and die in other fluids, adds to its seriousness if improperly handled.

We must not lose sight of the fact that the protection of our milk supply is like many other problems in preventive medicine. It lacks the dramatic effect. The rank and file of our people do not seem to grasp the fact that to prevent sickness and suffering is nobler than to administer in an unnecessary illness. We must disabuse the public's desire for glowing headlines in our public press as evidence of progress. It is common knowledge that tuberculosis exacts an annual toll greater than the number killed by bullets in the four years of our Civil War; yet compare the stir caused by this knowledge as to that caused by even the suggestion of war. The final solution of the milk problem will require mutual co-operation between the producer and handler, the consumer and the inspector. The veterinarian, by training and impartiality, should play a very important part in the realm of adjustment and protection.

So much for the general condition of veterinary matters as we see them to-day. But there are still some other very important sides of our veterinary problems that are largely within our own command. I refer to the educational side, the interchanging of knowledge, so to speak. I care not how skilled a practitioner may be, there are times when we will meet cases that are so wanting in true characteristics or so confusing in symptomatology as to make a definite diagnosis unwarranted; and if we are conscientious men, as we should be, it is then that we turn to the man who by special training and equipment can assist us in solving the problem and make it possible for the practitioner to serve his community to a better advantage. I fear the general practitioner is not always as appreciative of the assistance he receives from laboratories as he should be, and I doubt if we have all done our share in assisting the laboratory man to be the greatest possible good.

When we stop to consider how absolutely helpless we oft-times are when called upon to investigate an epizootic or enzootic

presenting symptoms or characteristics with which we are not familiar, how we oftentimes have to grope aimlessly and hopelessly around in the dark. True it is that occasionally we may trace the cause of our trouble to some dietary error or local conditions, but more often we are apt to seek the assistance of the laboratory man either in determining the causing factor, or giving us reasonable assurance that we are not dealing with a contagious plague. I think it can be truly said that most of us who err in giving assistance do so from lack of knowledge or carelessness rather than with any malicious intent. If, for instance, we should wish the brain of an animal examined owing to the fact that during life it exhibited certain nervous phenomena the cause of which we were not certain but had in mind the possibility of rabies; we should not expect the laboratory man to patch together a masserated hypo-camp that had been mutilated by force. It would be still more hopeless to expect animal inoculation of the brain lesions to verify the microscopical work, had putrefaction set in, or if disinfectants had been used as a preservative rather than cold temperature. These same principles hold true in sera diagnosing the examination of organs, neoplasms and the like. The proper method in securing of an organ or a tissue for examination and still further proper preservation of same until it reaches the laboratory will gladden the heart of the laboratory man and bring to us more satisfactory answers.

The present outlook for the properly educated and trained veterinarian is as bright if not brighter than ever before. A little over half a century ago the number of educated veterinarians on this continent could have been counted on the fingers of one hand. The profession was then represented principally by graduates from foreign shores and a few so-called self-educated men, the later who, through their love for animals and interest in the alleviation of suffering, made a special effort to administer to the dumb brutes as intelligently as their knowledge acquired by books and experience could warrant. We have nothing but praise for our old graduates and the honest, well-meaning non-graduates, but we must likewise admit that our profession at

that time was overwhelmingly represented by the type of men pitifully wanting in ability and conscience. I remember as a youth looking on with boyish terror at the cruel, barbaric treatment our stock was subjected to from time to time. It is not a matter of ancient history when the self-exploited veterinarian bored holes in the cow's horn and filled them with turpentine, or poured melted lard in the poor, suffering animal's ears after a wise diagnosis of horn distemper. Similar cruel treatment was sure to be the lot of the animal that through illness of any kind showed a flaccid condition of the tail, when a jackknife would be sharpened on the bootleg, the tail split and the opening filled with pepper and salt, which would make the animal squirm and thereby show evidence of great and suddenly reviving life. We should rejoice that the days of empiricism are passing. The public, recognizing the necessity of a scientific administration to the dumb brutes similar to that being administered toward the alleviation of pain and suffering in the human family, encouraged the fathers of veterinary medicine in this country, and these good men, withstanding all the trials and vicissitudes, scorn and criticisms that were cast upon them, slowly through their since efforts brought up the standard of the veterinary profession until to-day it is looked upon in most states as the equal in every way to other professions such as medicine and law. Young men of refinement and education have been induced to enter the profession. Veterinary schools of magnificent type are being built, where an education quite in keeping with that of any other profession is available for veterinary students. As our veterinary profession has grown, associations and membership have multiplied, until to-day nearly every state, territory and province in this country can boast of one or more veterinary associations.

VETERINARY SOCIETIES.

All veterinarians should support and take active interest in veterinary associations; they first, last and always stand for better education and better organization, to the end that we may better serve mankind, the brute creation and the livestock industries of our country.

Veterinary societies are a benefit to every veterinarian; I care not whether he be a specialist or a general practitioner, the very atmosphere of these gatherings is pregnant with knowledge and suggestions that are sure to develop a thought or clear a problem that heretofore never occurred to us, or on which possibly our knowledge had been too meagre to be of any value to us.

While I have said but little concerning general practice, this in my judgment is perhaps the most important branch of veterinary science.

I have the greatest respect for the chemist, bacteriologist, and biologist. Without them I fear that medicine and veterinary medicine would stand still or make progress discouragingly slow. Think of the evolution in the practice of medicine that these men have brought about. The future limit of serum therapy, anti-toxins, phylacogens and vaccines no man dare predict; but, again, we must not lose sight of the fact that the practitioner is the man who must make use of any apply this and like knowledge, if these preparations are to reach the fields that they were primarily intended for. Expert knowledge kept in laboratories or experiment stations would do the world at large but little good.

In conclusion, it is my judgment that veterinary education is in the era of ascendancy, and if we are to continue to make progress it behooves us to be thorough students in all matters pertaining to the class of work in which we are laboring. Honesty with ourselves and our clients, our work and our results, are good watchwords for the onward march of the profession that each member should support and add to its usefulness.

DR. HIGGINS TALKS ON ANIMAL DISEASES AT HARVARD MEDICAL SCHOOL.—Dr. Chas. H. Higgins, pathologist to the Dominion Department of Agriculture for the past fifteen years, delivered a lecture (according to the *Boston Globe*) at the Harvard Medical School on Sunday, November 15, on "The Protection of Animals Against Infective Diseases." Dr. Higgins, who took his veterinary degree at McGill University, is also a graduate of Massachusetts Agricultural College.

GENERAL EDUCATION IN REGARD TO GLANDERS AND PUBLIC DRINKING FOUNTAINS.*

BY DR. B. T. WOODWARD, QUARANTINE DIVISION, U. S. BUREAU OF ANIMAL INDUSTRY, WASHINGTON, D. C.

Glanders is a subject of ever active interest to the veterinary profession, and many papers upon glanders are written and discussed by its members.

An important adjunct, it would seem, is a general education of the public, and especially of representatives of humane associations and of the police forces of the cities and towns to which are assigned the duties of preventing cruelty to animals. The American Humane Association recognizes the importance of this aspect of the glanders problem, and upon its request the writer presented a paper upon this subject at the 36th annual meeting of the Association, which was held in 1912.

An intelligent understanding among horse owners and the special classes of people already mentioned would assuredly be of great benefit to the live stock authorities in controlling glanders, and would lead to greater harmony in the enforcement of necessary legislation.

This paper does not purport to contain new information for the veterinarian, but endeavors to present the subject of glanders for the consideration of the people who are interested in horses and their welfare. The layman should understand that up to a comparatively recent time glanders and farcy were considered to be two distinct diseases, and that we now recognize them as a single disease known as glanders, of which farcy is but the designation of the skin symptoms.

Glanders is a dangerous communicable disease of horses, asses and mules, prevailing in various extents in the majority of

* Presented to the fiftieth annual meeting of the American Veterinary Medical Association at New York, September, 1913.

the countries of the world. It is probable that no State of these United States is entirely free from the disease, and the greatest number of its victims are claimed in the cities, rather than in country districts.

Although glanders shows such a marked predilection for equines it is readily communicated to man, dogs, cats, rabbits and guinea pigs. Fortunately, however, it is practically impossible for cattle or chickens to contract the disease, and it is rare among sheep and goats.

It is one of the earliest recognized diseases, for Hippocrates, about 450 B. C., and his follower, Aristotle, gave it a distinct place in their writings. From the fourth century to our era it has appeared in veterinary writings, with a recognition of its contagiousness, which has been so well and frequently demonstrated by the repeated outbreaks in the cavalry of European countries and its appearance in previously free localities following the invasions of war or civilized commerce.

It awaited our present generation, however, to discover the cause of the disease, and in 1882, Loeffler and Schutz, in Germany, isolated the specific germ, which they described and named "*Bacillus mallei*." We should realize then that no case of glanders exists or can be contracted unless the affected animal has come in contact with and harbors this one distinct form of germ life, the *Bacillus mallei*.

This organism is found principally in the nasal discharges, the pus exuding from farcy buds, and in the saliva and manure. From these sources other materials are infected by contact, making them secondary carriers of glanders. Among the secondary carriers for the dissemination of glanders which are thus produced there may be mentioned the public or common watering troughs, mangers, nose bags, harness, curry combs and brushes, stable attendants, wagons, public hitching sheds and posts, blacksmith shops, and access to manure piles.

The factor of greatest importance is the direct contact of healthy horses with glandered horses affected with the disease in an acute form. The contagion is in its most virulent form in

acute cases, and the infected discharges invariably produce glanders when inoculated into animals of a susceptible specie.

The discharges from old chronic or semi-latent cases are not nearly so active and dangerous, but they should never be overlooked as an important source for the dissemination of the disease.

Having gained entrance into the body variable periods extending from a few days to years may elapse before the appearance of lesions of the disease. Experimental inoculations have however demonstrated by postmortem examination that internal lesions have developed in from one to three weeks after inoculation.

Workers in humane societies and others associated with horse welfare should have a general knowledge of the visible symptoms which are presented by glanders during its development. Through this knowledge they will in many instances be able to diagnose clinical cases of glanders as they appear among horses upon the street, in public sale stables and other places, and thus be very valuable aids in determining centers of infection and co-operating with health officials in eradicating the disease.

Glanders develops more rapidly and more frequently in the acute form in young horses than in old. The rate of development depends largely upon the age of the horse, its general vital condition, the character of feed and work, and the appearance of general fevered conditions or local injury.

A well-fed horse subjected to work which never exhausts it may be affected with latent glanders for years, showing no symptoms which even point to suspicion. The first symptoms to make its appearance is not always the same, and we must therefore watch for the development of any of the symptoms of glanders. A leg, usually the hind leg, may suddenly become swollen, and this swelling is usually followed by the appearance of what are termed farcy buds or buttons.

The farcy bud is a lump varying in size from a bullet to a walnut. They are first felt or seen beneath the skin, which structure they will involve, causing the death of the part immediately over the bud. There is then formed an ulcer with a dirty

gray appearing bottom, surrounded by ragged overhanging edges of skin. From this ulcer there is a discharge, the important feature of which is a consistency such as the white of an egg possesses, combined with a color simulating olive oil. It is very tenacious, and adheres to the edges of the ulcer over which it gradually forms a scab, which becomes thicker and thicker until it drops off and is replaced by the same process. Some of the discharge drips downward and is found adhering tightly to the hair. The ulcers may leave a permanent scar.

The presence of a discharge from the nostrils should always be regarded with suspicion, and lead to a careful examination. The character of the discharge is similar to that from the farcy bud, and is characteristic in its adherence to the wings of the nostril. The lining membranes of the nostrils frequently show small nodules which break down with the formation of deep ulcers, the bottoms of which have the same general appearance as the ulcer of farcy. When close together these ulcers may coalesce and gnaw their way entirely through the septum between the nostrils. If ulcers heal there remains almost indefinitely a typical whitish scar, star shaped, with rays extending in various directions from its centre.

The swelling of the submaxillary lymphatic glands which are located high between the branches of the lower jaw and under the base of the tongue is also of great importance. In glanders these glands are not sensitive, but are hard and indurated, like a bunch of hard grapes, while in the swelling of the same glands in such diseases as influenza or distemper they are sensitive, have a more doughy consistency and tend to break down with pus formation.

Lymph vessels lying close beneath the skin may become indurated and appear as hard cords. Animals affected with these symptoms of glanders usually have slatish gray nodules of the disease scattered throughout the substance of the lungs, and from these there is produced the symptom of coughing, which rather closely resembles the coughing of a horse affected with heaves.

The humane officer, and frequently the veterinarian, is unable

to determine the presence of glanders in those horses where the disease is occult, or latent, and where there is no external evidence of its spreading. The detection of such cases is of great importance in the suppression of epizootics of the disease.

In the control and suppression of outbreaks ultimate eradication should be the aim. To carry out this work we need certain fundamental legislation such as laws which compel the veterinarian or any other person whatever to report promptly to a designated authority the presence of every single case of glanders or suspected case.

After the establishment of the diagnosis of glanders, authority should exist for the slaughter of every diseased animal, either with or without reimbursement to the owner, and all infected premises should be submitted to a thorough disinfection, subject to official supervision. A provisional quarantine should be established by which the identity of all animals exposed to the infection, or as we usually term them "contact horses," might be maintained so that such animals could be kept under surveillance. We should act upon the supposition that every clinical case of glanders may prove to be a centre by which the remaining horses in the stable would become affected with the disease, or as a centre from which it might spread indefinitely by the contamination of public water troughs.

As a result of the latest scientific investigations it is important that all contact horses be submitted to a special test for the diagnosis of possible latent cases. The complement fixation method for the diagnosis of glanders was discovered in 1909, and the eradication of glanders from that country, and of the United States Bureau of Animal Industry in official work. Its accuracy is considered to be more than 97 per cent., and when combined with what is known as the agglutination test it is practically 100 per cent. perfect in its positive diagnosis.

The use of this method requires that a small quantity of blood be removed from the horse by means of a trocar and canula, and submitted to a laboratory for examination which requires about 24 hours to complete. Horse owners more readily submit

their stock to this test than to the mallein test, which is less accurate and requires the stabling of the horses for at least 24 hours.

In some cities and countries horses which react to any of the various tests, but show no clinical evidence of glanders, are permitted upon the streets, but it has been the experience of Dr. J. G. Rutherford, formerly Veterinary-Director General of Canada, under whose direction very extensive work has been conducted in the eradication of glanders from that country, and of the United States Bureau of Animal Industry in stamping out an outbreak of the disease in Washington, D. C., that it is a dangerous plan not to destroy these reacting horses. It is therefore recommended that the policy of destroying all known cases of glanders be established.

The matter of disinfection is of great importance when we consider, as mentioned early in this paper, the methods by which the disease may be transmitted. The infected stable should first be thoroughly cleaned and then saturated with a reliable disinfectant. All of the harness which has come in contact with diseased animals should be soaked in the disinfectant, as well as curry combs and brushes. These latter in the hands of stable men are especially dangerous, as they are used promiscuously upon different horses in the stables, and should there be any abrasions of the skin the glanders bacilli upon the curry comb or brush would readily make a direct inoculation.

Precautions as outlined would probably be sufficient to stamp out an epizootic in the country section, and in the cities also if it were not for the many public sources of infection, among which I will draw special attention to the public drinking fountain.

When a glandered horse with a nasal discharge drinks from a public drinking fountain, not infrequently some of the discharge is deposited in the water, or the animal may rub its nose against the edges of the trough, smearing the infected discharge thereon. As healthy horses drink from this contaminated source they are liable to become infected. Glandered and healthy horses drinking at the same time at the trough may come in direct contact by rubbing their noses together.

An English investigator demonstrated by laboratory experiments that the bacilli of glanders may live unharmed in ordinary London water for 26 days in the month of August. This is a period of the year when horses draw largely upon public drinking troughs for their supply of water, and clearly demonstrates the danger from this source in the spreading of glanders.

The veterinary sanitarian is in perfect harmony with the humane societies of the country in their efforts to supply drinking water to horses working upon the streets, but as the public fountains may be such a prominent cause of the dissemination of glanders the sanitarians desire the co-operation of the societies in the establishment of such means of watering horses as may fulfil the requirements of humanity, and protect the horses from contracting disease.

Two methods for the public watering of horses may be satisfactory. First, the installation of hydrants at frequent intervals along the streets, the drivers of horses carrying with them individual water buckets. This measure, which is efficient under any conditions, has been found necessary in controlling outbreaks of glanders. In various cities the suppression of the disease has not been accomplished while the general public water troughs were maintained. The other method is the installation of fountains made of non-porous, durable material, which are specially constructed to supply constantly fresh water and carry off any contaminated substances. As a type for such trough it is recommended that it be so formed that the noses of horses cannot come in contact while drinking. The entrance of the water should be from the bottom of the trough in such manner that a constant rotary current will be produced. As the water reaches the surface it should flow over the rim of the trough throughout its entire circumference, being caught beneath in a basin which is covered to prevent it from being accessible to dogs and cats.

As some heavy material may be deposited in the water and sink to the bottom of the trough rather than pass with the current over its edges, an exit pipe from the lowest point of the base of the trough should be provided to carry away this sediment.

No public trough should be permitted to exist which is not equipped with a constant flow of water, and in which the exit pipes are not of ample diameter to carry away material which may be deposited in the water. Troughs should be subject to frequent and thorough cleansing and disinfection.

The trough equipped with a float which permits the entrance of water only as the amount in the trough is lowered by drinking should not be tolerated.

To-day the general public is becoming awakened to the manifold dangers lurking in the public drinking cup for humans, and a number of States and cities have prohibited by law the maintenance of public cups by transportation companies and in office buildings.

To keep abreast with the modern progress of sanitation and preventive medicine, and to protect the horses who must drink wherever water may be presented, we should work for the abolition of the public drinking fountain, or for its regulation, permitting only the establishment of such fountains as are constructed upon sanitary principles.

ILLUSTRATED LECTURES ON THE CARE AND TREATMENT OF WILD ANIMALS.—Prof. W. Reid Blair, of the New York State Veterinary College at New York University in New York City, and Veterinarian and Pathologist to the New York Zoological Park, gave a course of illustrated lectures on the care and treatment of wild animals in captivity to the students at the Ontario Veterinary College, Toronto, Canada, the third week in November. Our esteemed friend, Prof. E. A. A. Grange, principal of the school, presided, and the lectures were largely attended by members of the profession, students and laymen. During the course of his lectures Prof. Blair corrected the impression that tuberculosis is rampant in wild animals in confinement, and left the impression with his hearers that rachitis and osteomalacia were common and that parasitic diseases were the cause of considerable mortality.

At the recent meeting of the Tennessee Veterinary Medical Association held in Memphis Dr. Tait Butler and Mr. Harry C. Moore were elected to honorary membership.

CANNABIS.*

BY HERBERT F. PALMER, PHILADELPHIA, PA.

Cannabis Indica or Indian Hemp is the name under which all of our cannabis of former days was marketed. Cannabis Indica is obtained from the plant cannabis sativa, a native of Caucasus; Persia, and the hilly regions of Northern India. It is an annual plant, from four to eight or more feet in height, with an erect branching angular stem.

The U. S. Dispensatory says: "The hemp plant of India, from which the drug was formerly derived, has been considered by some as a distinct species and named Cannabis Indica, but the most observing botanists, upon comparing it with our cultivated plant, have been unable to discover any specific difference. It is now considered a variety and is distinguished by epithet, 'Indica.'"

It was Mr. H. C. Wood who first used the American plant by taking a parcel of plant from Kentucky, making an alcoholic extract, and found it effective in less than 1 gr. This result was so decisive that at the 1880 Revision of our Pharmacopeia, the American plant was recognized, but in 1890, it was dropped as *C. Americana*.

Remington in his *Practice of Pharmacy*, says: "The dried flowering tops of the pistillate plants of Cannabis sativa (Linne) grown in the East Indies and gathered while the fruits are yet undeveloped and carrying the whole of their natural resin." In the native Indian fields, the male plant is removed from the field long before the female plants are gathered, as they considered the unfertilized female plant would produce a greater quantity of resin than if both were allowed to grow together. In America

* Paper read at fiftieth anniversary meeting, American Veterinary Medical Association, New York, September, 1913.

no particular attention is paid to this fact. Such Indian cannabis contains a resinous substance—cannabinine, volatile oil and tetano cannabinine. Alcohol is the best solvent for the active principles.

According to Winslow in his *Materia Medica*, the active principle of Cannabis Indica is Cannabinol, a red oil or resin boiling at a high temperature. The therapeutic value of the principle has not been sufficiently studied to enable it to be used as a substitute for the crude drug or its preparations.

The fluid extract and a tincture are official. According to Caspari, much of the commercial drug is of poor quality, and it seems desirable to have the fluid extract tested physiologically before it is used.

There are three varieties of Cannabis now used by the veterinarian—the Indica, the African and the American. Each is given the same chemical and physiological assay, and as far as can be determined, they are identical in strength. Isolated patches of the American variety are found in the outskirts of Philadelphia, and some of the commercial article has been grown. Both of these patches gave a plant from which a fluid extract of Cannabis Americana was made, which tested high in physiological activity. This nearby supply of the hemp plant enables the great reduction in price of the American over the Persian product.

Charas or Churrus, or Hashish, as the Arabs call it, is a resinous substance obtained from the yellow glands of the plant. It is secured either by rubbing the flowering tops of the plants in the hands and scraping the resin from the hand or by men clothed in rawhides running through the dwarf plants, securing enough of the resin on the rawhide clothes to collect into a ball, which they call charas. This crude material was formerly employed as an intoxicating agent, but is now excluded from civilized medicine.

Cannabis is assayed both chemically and physiologically. In the physiological assay, 0.2 gram of fluid extract of Cannabis per kilo of weight of dog must produce first, excitability; second, muscular inco-ordination, followed by lassitude and sleep. The results are shown for several hours.

It has been clearly shown in the laboratory that the physiolo-

gical assay does not always follow the results of the chemical assay. For instance, the chemical assay will determine the amount of the resin, but the physiological effect does not always follow the percentage of resin.

The following table shows the comparative results of both physiological and chemical assay of the three varieties of Cannabis:

Cannabis Indica.		Cannabis Africana.		Cannabis Americana.	
Chemical Assay. % Resin.	Physiological Assay. %	Chemical Assay. % Resin.	Physiological Assay. %	Chemical Assay. % Resin.	Physiological Assay. %
12.2	....	.....	....	.....	....
12.7	....	10.6	100	6.4	133
14.25	100	16.77	133.33	12.46	100
12.81	100	14.2	133.3	14.09	100
13.04	80	8.6	100	.....	....
13.4	66	10.0	133	.....	....
.....	....	17.5	Less than 20	.....	....
.....	....	18.79	100	.....	....
.....	....	17.78	83	.....	....
14	160	10.71	133	12.94	133
10.38	133	.....	....	5.29	100
.....	....	.....	....	6.55	100
.....	....	.....	....	10.78	160
15.07	133	.....	....	.....	250
.....	200	.....	....	.....	114
.....	140	.....	....	17.06	114

From the observations made on dogs, it was shown that Cannabis Africana exerts a more hypnotic effect than Cannabis Indica. This conclusion was also borne out with its use on horses at the University of Pennsylvania. We feel positive also that it will be shown that Cannabis Americana will be found to possess less deliriant and more of the hypnotic effect than the Cannabis Indica.

According to Winslow in his *Materia Medica*, Indian hemp is a distinct depressant to the functions of the brain and cord in poisonous doses, although small quantities thereapeutically stimulate these organs. It produces in man a kind of intoxication and mild delirium. It is not comparable to morphine as an analgesic on account of the uncertainty and slowness of its action and because anesthesia is only produced by an unwarrantably large dose. It is only superior to opium in not causing constipation, anorexia or indigestion.

For this latter reason, veterinarians have often employed cannabis, and profitably so, for the relief of colics of the horse. Many make it the chief anodyne of their colic mixtures. In all such cases it has been used *per orum* and very satisfactory results thus obtained.

Such use of the drug is to be commended. There has however come a tendency to use this drug in the vein. This has no doubt arisen from the fact that quick action is desired and also from the fact of its being used on "Subs" and no immediate bad results noticed. Dr. E. L. Quitman, at a recent clinic of the Missouri Valley Veterinary Association, said in substance, the active principle of cannabis indica depends on a resin, and when resin and water are mixed, a gummy precipitate results. This is exactly the same when cannabis and blood are mixed. This resin introduced into the blood stream may not at once form a thrombus and you will likely produce complete anesthesia. You may however have a case of obscure lameness in the same horse, to which you gave the cannabis in the vein, and it may be days or even months afterward. The cannabis may have formed a thrombus and even at this late date given trouble.

To ascertain what effect the alcohol contained in the fluid extract would have, a series of test dogs was used. The regulation dose of 2 gram per kilo of body weight was given of alcohol *per orum*, and no appreciable results noticed. However, if an alcoholic equivalent of .2 gram per kilo of body weight was given in the vein, the result was very similar to the fluid extract of cannabis. Excitability, inco-ordination and lassitude followed the alcoholic dose in about the same way and lasted about as long as the standard dose of fld. ext. cannabis when given in the vein.

These results were rather startling, so similar work was tried upon a horse, but with far different results. A dose of alcohol equivalent to two and three times that contained in cannabis was given in the vein. Only slight reactions were noticed and nothing like the excitability, inco-ordination and lassitude was obtained as with cannabis.

However, the proportionate dose of cannabis for the horse is

far less than for the dog. In the vein of the horse action is obtained in doses of about .02 grams per kilo of body weight and great variation is also noted upon the individual animal.

These results show us that the full action of cannabis was not due to its alcoholic content.

It also showed the amount of cannabis necessary to produce physiological effect in a horse was much less in proportion to weight than in a dog.

PRESIDENT CHASE'S LETTER.—In forwarding the minutes of Secretary Pro Tem. J. Payne Lowe, of the alumni association of the New York-American Veterinary College, President Chase, of that organization, sent the following letter of transmittal, which is so full of enthusiasm and seems such a direct message to his fellow alumnae that we have thought best to reproduce it.

BAY SHORE, N. Y., OCT. 24, 1913.

Dr. R. W. Ellis, Dear Doctor:

Enclosed herewith please find minutes of alumni meeting held at Hotel Astor.

It is the aim of the present officers of the alumni association to make our association a stronger and more powerful organization for good, and now that our college has received State recognition should be an impetus to all the old graduates to do what they can to help place her upon a firm foundation as the leading veterinary college of America.

It is earnestly requested that all graduates who have not as yet affiliated themselves with the alumni association send their names at once to the secretary, Dr. P. K. Nichols, Port Richmond, S. I., N. Y.

Do not let the spirit of fraternity lag in our association, but help keep fresh the pleasant memories of our college days, and by our moral support aid the faculty and encourage the undergraduates.

Fraternally yours,

CHAS. S. CHASE, D.V.S.,
President Alumni Association.

APPRECIATED UP IN SASKATCHEWAN.—A subscriber away up in Saskatchewan writes in renewing: "I have much pleasure in saying it is really a veterinary library in itself; and I don't want to miss a *single* number of the REVIEW."

THE ABSOLUTE RELIABILITY OF DOUBLE ANTHRAX VACCINE IN CONTROLLING WELL-ESTABLISHED OUTBREAKS OF ANTHRAX.

BY DR. WM. W. YARD, STATE VETERINARIAN; SECRETARY STATE VETERINARY EXAM. BOARD; CHIEF STATE MEAT INSPECTION, DENVER, COLORADO.

During the month of September, 1910, there was reported to me by the local U. S. Veterinarian in the southern part of the State of Colorado, a serious outbreak of anthrax in some pedigreed steers.

An investigation was immediately started, and cattle and horses were found to be dying here and there for about eleven miles of territory. The usual quarantines were established, animals dead were all burned. This is one of the most important measures to be taken first.

The balance of the well cattle were put upon non-infected pastures and immediately vaccinated with the double Pasteur vaccine, the vaccinations being ten days apart.

Where animals are at the time of the vaccination infected, they will die quickly, so that there is always a chance of a few dying from the so-called vaccination; but in this outbreak there was not another head of cattle died; and although this section of country had been horribly exposed to the infection, there has not been reported any more cases of anthrax from that section to date.

During July of this year anthrax was reported twenty-five miles west and north of the 1910 section. Upon investigation it was found that horses, cattle and hogs were dying of the disease over an area of some fifteen miles. Some one or two local veterinarians had been called in and were, and had been, vaccinating with a single vaccine and the stock was still dying,

so I as state sanitary officer persuaded the veterinarians and the owners to revaccinate, which was done as soon as 2,000 doses of doubles could be obtained, and they ceased dying at once.

This same method was used over another section in which several animals died on the streets of a large town. Just as soon as they could be vaccinated with the double vaccine they stopped dying, and the reported loss from the vaccination is practically nothing. There is now another outbreak which has jumped twenty miles, and they are vaccinating as rapidly as is possible.

It is a simple procedure in competent hands in stock on the farm; but I have found a number of cases on the open range, and although the owners of the cattle are well known and are more than willing to do all in their power to co-operate in controlling the spread, it is a matter requiring serious and very intelligent thought to advise how to control the range for the present as well as the future, as the exposed stock roam over an area of some 200 miles south principally. But I can assure any state veterinarian that the double vaccine, in my hands at least, has proven its never-failing control of anthrax, and we have had several serious outbreaks of this disease which promised of rapid spread when we took hold of it.

NEW YORK STATE VETERINARY COLLEGE, at Cornell University, Ithaca, N. Y., celebrated the formal opening of the new hospital and clinical buildings for large and small animals on November 15th last. The exercises were opened at 8 p. m. by President Schurman, followed by addresses from Director V. A. Moore, Dr. D. H. Udall, Dean David S. White, of the College of Veterinary Medicine, Ohio State University; Dean Louis A. Klein, of the School of Veterinary Medicine, University of Pennsylvania; Prof. James Law, first Director of the New York State College; and others. The exercises were followed by an inspection of the new buildings.

DR. DELL'S SAD AFFLICTION.—Through the *Los Angeles Times* of October 25, we learn of the death of Mrs. Hazel Dell Boller, at Alma Center, Wis., daughter of Dr. J. A. Dell, of Los Angeles, California. In tendering its sincere sympathy to Dr. Dell, the REVIEW voices the sentiment of the whole profession.

REPORTS OF CASES.

AN UNUSUAL CASE OF CONSTIPATION IN AN AGED HORSE.*

BY CHESTER L. BLAKELY, M.D.V., Augusta, Me.

On February 2d I was called to see an eighteen-year-old horse, weighing 1,100 pounds, a driver, that had laid down after breakfast as if in pain. The horse showed no signs of pain after my arrival, and my diagnosis was tardy action of bowels, due to too *little* exercise and too *much* feed.

I gave one of Abbott's purgative tablets and left a mixture of nux-digitalis and belladonna to be given every three hours on tongue; and gave hot water rectal injection. Next morning the report was no action from bowels and no appetite or signs of pain. I gave another purgative tablet and orders to repeat tablet every six hours, with hot water injection every three hours.

The next morning the same report. No action, no pain, no appetite. On giving rectal injection a few large masses of chewed shavings and fæces were expelled, and I removed several with my hands. From this time (Tuesday until Saturday) the bowels did not move, in spite of the administration of three pounds of epsom salts in one pound doses, and three quarts pure raw oil in 1 quart doses six hours apart, with hot water injections, diuretics and daily exercise. On Saturday I gave 60 grains borium chloride (6-10 grain tabs.) intravenously, purgative (Abbott Alkaloidal Co.'s) with $\frac{1}{2}$ ounce of chloral hydrate in one pint of hot water; and during the afternoon bowels moved quite freely.

From Saturday, February 8th, after this thorough cleaning of bowels, I gave daily exercise, tonic of nux-digitalis and belladonna and diuretics. Appetite fair; bran mash and very small amount of hay and some form of physic, either salts, oil or purgative tablet, every night until February 19th, when I called Dr. Joly in consultation.

The owner was absent in California and when notified that horse was sick and had been for 2 weeks, he wired for the hostler get me to have a well known non-graduate in consultation and to wire him our decision. Feeling that I was doing my best, I de-

* Read before the October meeting of the Maine Veterinary Medical Association at Waterville.

cided to have a consultation with a man of my own selection and take chances of incurring owner's displeasure, so I called Dr. Joly, and he prescribed 1 gr. strychn. sulph. hypodermically three times daily, with one pint pure raw oil and one ounce of turpentine each night and morning for three doses.

I wired the owner that I had had Dr. Joly in consultation and that it was his opinion that horse would recover.

From the 19th to the 21st there was no action, making a period of thirteen days (8th to 21st) that bowels had not moved.

I now grew desperate and gave 90 grains of barium chloride— $\frac{1}{2}$ ounce chloral hydrate—in one pint of hot water, and still the bowels refused to move. No pain, normal pulse, normal temperature, no appetite.

The next day, Saturday, I gave 90 grains of barium chloride with chlora and hot water, and in two hours the coachman's wife thought she detected a peculiar odor; and on investigating found the horses bowels had moved three or four times, the discharges being quite hard.

From 2 to 3 p. m., the coachman counted fifteen distinct movements of the horses bowels; and during the six hours after administration of barium he was sure five bushel baskets of fecal matter were discharged. Sunday morning the horse looked as though he had been drawn through a knot hole; but was hungry, had normal pulse and normal temperature. From now on I gave tonic of ammon. carbonate gentian, nux vom and spts. nitre in watery solution every eight hours; daily exercise and hot mashes and small ration of hay, and the animal gradually regained use of his bowels, and on March 1st I ceased calling on him.

This horse was bedded on pine shavings, and not having much to do had got into the habit of nibbling at the shavings.

The peculiar part of this case is the length of time that there was no action whatever (13 days), the freedom from pain, the lack of disturbance of temperature and pulse.

Trusting that this will illustrate the possibility of recovery even after a two weeks loss of action of bowels, I submit this case for your kind consideration.

NOTE—This case of Dr. Blakely's is interesting, not alone to the younger practitioners because being out of the common it enlightens them, and prepares them to more successfully cope with the same conditions when they meet them in their own practices, but is also interesting to the older practitioners, who by reflection call to mind that the cases of that kind that they have met, have also usually been in aged horses. Which suggests that age is a predisposing factor in this troublesome condition. The writer recalls several during twenty-five years of general practice, where the subjects have been aged horses; amongst which, is a case with many features in common with Dr. Blakely's case, reported on page 49, volume xxi, number i (April, 1897, of the AMERICAN VETERINARY REVIEW, entitled "*An Obstinate Case of Impaction of the Small Intestines.*"—[EDITOR.]

KNOT IN INTESTINE IN MARE.

By H. M. HAMILTON, V.M.D., Paris, Texas.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

Subject—Black mare, aged, weight 1,000 pounds, with colt six weeks old.

Symptoms—Was called early July 24th to see mare, owner says he found the mare sick upon arising. She showed very severe colicky pains. Would squat with abdomen close to ground when led; being loose in lot she would fall or lie down very suddenly and immediately roll upon her back, which position she was prone to keep. She would get up and run possibly 100 feet and fall again. Pulse, 54. Temp. normal. Membranes somewhat congested. Peristaltic action, none. Little flatulence.

The mare was given 1 gr. arecoline, $\frac{1}{2}$ gr. strychnine—with no effect. Repeated arecoline $\frac{1}{2}$ gr. in one-half hour—no effect. Gave her 2 drams cannabis indica intervenously, and she lay down on her side and slept for possibly four or five hours, then I was called again. Mare was very uneasy as before. Pulse, 66, but strong. Temp. 100.5 F. Membranes congested. Repeated the arecoline and strychnine as in the morning, with rectal injection of cold water. This was followed by the passage of little flatus, and slight peristaltic action on right side. Rectal examination negative. Tried to administer drench, but animal would not swallow and received some down trachea, which ran out when head was lowered. Left animal about 5 p. m., lying upon breast very quiet. Told owner she would die and that I thought she had some displacement of the bowel. Called next morning, owner said mare dropped dead about 7 a. m.

Post mortem—Abdominal cavity, on opening, revealed a quantity of dark bloody fluid. Considerable peritonitis, and the last loop of the small intestine, just before it enters the caecum, was tied in one complete knot, completely obstructing the bowel, about three feet being involved.

PYAEMIC ARTHRITIS.

By H. M. HAMILTON, V.M.D., Paris, Texas.

Subject—Four-weeks-old female, grade draft colt.

History—Swelling appeared in left hock. Colt showing some lameness. The swelling extending to right hock.

Symptoms—Upon examining the colt on June 22, found swelling in both hocks, small swelling on left side over fourth rib in middle of the lower third. Colt seemed to be unable to control movements of hind quarters. Colt very strong, appetite good. Temp. 103 F. Pulse accelerated but good. Next day colt about the same except unable to rise when down, but when helped could get up and stand unsteady. On June 25 symptoms all somewhat more marked, could not stand alone; appetite still good. Some trouble voiding urine. Catheterized colt, found some sediment in urine of purulent nature. On June 29 colt very weak, head and legs skinned where it had struggled around in stall. Unable to get it on its feet. Advised owner to destroy same as I thought there was no chance for recovery.

Treatment—Mixed bacterial vaccines, June 22-25. Cold application to swellings and echinacea 2 drams three times daily.

Post mortem—Colt was destroyed and autopsy held June 29. Abdominal cavity being opened revealed the urachus and umbilical veins very much distended. Incising same found urachus filled with thick cheesy pus up to the bladder. The umbilical vein also distended up to the liver, the two containing about one quart of pus. Other organs normal. *Thoracic cavity*: There was adhesion of plura and lungs to the region of the swelling on outside, the fourth rib being fractured at this point. Also found an abscess in roof of plural cavity just below fourth and fifth dorsal vertebrae. Upon opening the abscess and following up the cavity found it entering the neural canal, involving the spinal cord.

This case was one of great interest to me as it is the only one I ever saw revealing paralysis.

ABLATION OF RIGHT MAMMAE.

By PHILIP V. WEAVER, D.V.M., Glen Cove, N. Y.

The enclosed cut shows the ablation of the mammae of the right side. This was the first case of gangrene of the udder occurring in my practice, and showed a typical line of demarcation. Cow down, out flat, pulse 70, temperature 103 and complete prostration. Upon explaining that the only chance of saving the cow's life was by the ablation of the affected mammae, the owner wished me to proceed; saying the cow was registered, a prize winner, was in calf and was worth saving if only for breeding purposes.

There was very little resistance to the operation. I gave, however, an ounce and a half of chloral and proceeded; cutting outside the line of demarcation and ligated each vessel, as I came



to it, so as not to have too bloody a field to work in. Thus bisecting the udder and removing the right half. This, the gangrenous portion, was enormously enlarged and left quite a large wound, which is now healing without complications.

ANTEMORTEM DIAGNOSIS OF A GUT-TIE.

By DR. R. A. GREENWOOD, Painesville, Ohio.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

A farm horse weighing about 1,400 pounds was taken sick in harness about half an hour after the noon meal. I was called immediately and arrived in about two hours, and found all the symptoms of gastric indigestion; but upon rectal examinations (the importance of which is further emphasized here), found about three feet from the anus a constriction of the colon which would barely admit two fingers. Injections beyond the constricted portion produced painful paroxysms.

The foreman informed the owner that the horse could not live and was shot.

Postmortem showed ball of feces tied in a hard knot, the size of two fists. No attempt at an explanation as to how this could occur was made.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

BY PROF. A. LIAUTARD, M.D., V.M.

CHRONIC NASAL DISCHARGE—[*Major E. E. Martin, F.R.C.V.S., D.V.H., A.F.C.*].—Artillery horse is laid up with apparently ordinary case of catarrh with lateral nasal discharge. There is a very strong odor from the nose. This has been observed since some time before. Some few days later, the discharge stopped but the smell persists, it is even more offensive. The animal is galloped and the discharge is absent. It returned after exercise and always with the same odor. There is no enlargement of the maxillary gland. The teeth are in good condition and nothing wrong with any of them. Malleine gives no results. Facial sinuses are explored but no explanation of the smell or of the odor can be found, even with repeated flushing. The animal was kept for some time and finally destroyed.

At the postmortem all the abdominal organs were found healthy. In the lungs there was in the anterior lobe of the right lung an abscess containing yellow creamy stinking pus. It escaped into the trachea through the bronchioles and communicated directly that way with the trachea. The horse had had strangles before and after recovery, was only laid up once without diagnosis declared, perhaps pneumonia. Either may have been the starting cause of the pulmonary abscess.—(*Vet. Record.*)

SPASMS OF THE LARYNX [*Herbert E. Whitmore*].—This occurred in two cases under the same condition of work, in hay field and in hot weather. Immediate relief was obtained by tracheotomy.

The first case was in a mare which was taken with difficult breathing. Her respiration was loud and her membranes cyanosed. Morphine injections and liniment externally giving no relief, and the condition assuming a bad aspect, the trachea was hastily opened and a tube introduced, followed by normal breathing in a few minutes.

The second case took place in a powerful cart horse. The animal showed similar difficulty in breathing, but more marked. The horse was standing, however, and when, to perform the operation, the head was raised he fell down and was operated in that position. As no tube was on hand, a piece of lead tubing was used instead. In both cases the tubes were left in place for a day or two for precaution.—(*Vet. Record.*)

CHLOROFORM STANDING [*J. H. Parker, M.R.C.V.S.*].—Three cases are records. One in a heavy Shire stallion, ugly in shoeing when standing. Three ounces brought him down, he never gave trouble after. A second Shire gelding to be operated for poll-evil and fistulous withers. No trouble.

A third, as soon as he had the chloroform muzzle on, started off full gallop, ran all over a field, was finally secured, cast with hobbles, and then chloroformed when down. He was unnerved on the off fore leg for navicular disease. After the operation he ate a mouthful or two and then began to blow and retch, bringing up mucus. He kept this for an hour or so and got over it.—(*Ibidem.*)

PREVENTION OF MILK FEVER [*James Smith, M.R.C.V.S.*].—As addition to a discussion of the subject, the author writes: My experience teaches me that neither the removal of the calf from the cow as soon as it is born, nor the leaving it with the cow, either causes or prevents the disease. Neither does refraining from milking the cow immediately after calving have that effect.

By the following rules, strictly carried out, the cow will not go down with milk fever. Suspicious cow, that every practitioner will recognize, is to be taken up and stabled a fortnight before due to calve, she is fed sparingly or exercised an hour daily. A few days before her time is up, she should get a mild aperient drench. At the time of calving her stomach should be fairly empty. After calving another aperient drench and fed on gruel and have treacle to drink. Enough milk may be taken at once to supply the calf, but the udder *must not* be stripped until after the third or fourth day, when gradually she is brought back to her rations and milked out. In very rare cases milk is allowed to be taken before calving, if the udder is abnormally distended.

These suggestions may appear as old fashioned, but try them, they are none the worse.—(*Vet. Record.*)

FRACTURE OF THE CUNEIFORM [*H. G. Tabuteau Herrick, M.R.C.V.S.*].—A five-year-old mare being led back to her stable and going up on an inclining plank to reach it, slipped and fell. Being unable to get up by herself, she was raised with temporary slings and it was found that she was unable to bear any weight on the off hind leg. This assumed an abnormal position, appearing longer than its mate. The point of the toe rested on the ground, whilst there was excessive flexion of the hock and fetlock. Looking at the injured hock it had the appearance of a very prominent curb. There was crepitation and increased mobility in the hock joint, peculiarly marked in movements of abduction and adduction of the metatarsus, yet the pain was not marked. The mare was shot the next day. On examination of the hock joint, a fracture of the cuneiform magnum in two equal pieces was found.—(*Vet. Record.*)

HODGKIN'S DISEASE IN A DOG [*Wilfred Walters, M.R.C.V.S.*].—An aged Scotch terrier was said by his owner to have goitre. He had about fifteen tumours under the throat in the region of the larynx, varying in size, quite painless and seeming to cause no inconvenience. The temperature was normal, appetite good and a slight cough was present. Tonsils were much inflamed. No positive diagnosis made and perhaps some bacterial infection suspected. After four days, two more swellings came on the point of the shoulder. As others made their appearance beneath the tongue and near the penis and as the dog did not improve by the iodine treatment to which he was submitted, he was killed. Some of the tumours examined were pronounced enlarged lymphatic glands and the case one of Hodgkin's disease.—(*Vet. News.*)

FRENCH REVIEW.

BY PROF. A. LIAUTARD, M.D., V.M.

FRACTURE OF THE CRANIUM IN A HORSE [*Major C. Lesbre, Army Veterinarian*].—This case adds another evidence of the diagnosis of such injuries when an hemorrhage from the ears or nose is observed on the injured animal.

An officers horse was being dressed for certain work by the application of very severe artificial means. At one of the exercises, the animal refused to submit to the apparatus, resisted and was stimulated by a touch of the whip on the nose, rears and falls

backwards. He rises, walks a few steps, rears a second time and dies immediately. An abundant hemorrhage took place from both ears and the nostrils. The diagnosis is made without hesitancy of fracture of the base of the cranium and confirmed by post mortem, which shows the guttural pouches and nasal cavities filled with clotted blood. The dura mater is separated from the bone and torn. The substance of the cerebellum and cerebrum is crushed, and with all these a comminuted fracture is exposed involving the roof and base of the cranium and forming three segments of the occipital, temporal, parietal and sphenoid bones.—(*Soc. des Sciences Veterin. de Lyon*).

606 IN INFECTIOUS PNEUMONIA [*Mr. C. Hebray*].—Gelding five years old, is placed in a stable where during the last twelve months six horses have died with pneumonic diseases. When he arrives to his new quarters, the horse is bled (5 litres, as is customary in that establishment). A few hours later he has chills, breathes with difficulty, the temperature rises to 40 degrees C. He is treated with mustard poultices, a second bleeding and anti-febrile intravenous injections. No improvement takes place, and as signs of laminitis began to appear, he receives arecoline, and on the sixth day of the sickness the writer is called. The horse has laminitis of the fore feet, respiration is 70, a thick yellowish discharge from the nostrils, pulse small and thready, 80; dullness on the lower third of the chest, respiration absent, temperature 40. It is a case of pleuro-pneumonia complicated with laminitis. An intravenous injection of 2 grammes of arseno-benzol Billon in 30 of physiological serum is given, cold poultices applied to the feet, sinapisms on the shoulders (?). An hour later, breathing is more difficult, temperature still 40- and 40-2. It keeps rising towards evening. From this moment the difference begins, the horse takes food, his pulse, respiration and temperature are improving. This condition is still better the next day, gradually the symptoms subside and after two days the horse is out of danger. There has been no relapse nor complication.—(*Rev. Genér. de Med. Véter.*)

SCLEROSIS WITH PARETO-ATAXIA TROUBLES IN A DOG [*Dr. L. Marchand and Prof. G. Petit*].—Six-year-old fox terrier has very imperfect history. He is sick since several months, and his ailments began by troubles in his locomotion. Without being paralyzed he does not walk any more in a straight line and seems to have certain hesitancy in his motions.

Now the principal symptoms consist in motor and sensitive troubles. For the first, they are in muscular co-ordination. They are more marked when the dog is standing or walking. Standing the hind legs are stretched and extended outwards. The anterior show pareto-ataxic troubles still more marked; the legs are carried outwards as if they gave away under the weight of the body. The back is arched; so much so at times that when the hind quarters stand its proper height with the legs in extension, the anteriors are flexed and the head rests on the ground. There is also a direction to the right of the fore on the hind parts. Equilibrium is unsteady and the dog falls with the slightest push. In walking the dog throws his legs outwards, in the direction he is moving; they are hesitating and the tendinous reflexes are weak. There is no amyotrophy. The troubles of sensibility consists in anesthesia and generalized analgesia. The animal is indifferent to even deep pricks and yet any movements of the body are extremely painful. Raising of the head provokes loud cries and brings about an erection. Olfactory, gustatory, ocular sensibility seem normal.

Incurable, the dog was destroyed. No lesions were found anywhere except in the nervous centres, which by histological examination presented a medullary sclerosis with predominance of the lesions upon the posterior and lateral fasciculi of the spinal cord.—(*Rec. de Medec. Veterin.*)

FRACTURE OF THE SECOND DORSAL VERTEBRAE IN A HORSE [*Major E. Larioux and Lieut. Richon Army Veterinarians*].—While manœuvring a mare is severely injured by a fall, is unable to get up, and presents the following symptoms. Lying on her left side, the fore legs are slightly flexed and moving now and then, the hind legs are in extension and motionless; the head and neck are raised only when the animal attempts to get up. Respiration is accelerated, pulse small; the hind quarters, the anus, the vulva are insensible to pricks. There is general loss of motion and sensibility from the middle of the back. There is paralysis of the bladder and rectum. Fracture of the vertebral column is present. The mare is killed. At the post mortem, there was found a comminuted fracture of the body of the second dorsal vertebrae with crushing of the spinal cord. There was a dislocation upwards of the second rib of the right side.—(*Bullet. de a Soc. Centr.*)

FRACTURE OF THE STERNUM AND RIBS [*By the Same*].—The same accident, when the preceding case occurred, was also the

cause of another, which took place on another mare, sixteen years old. Thrown down also, she got up with difficulty but was incapable of putting weight on the right forefoot. She moved on three legs. The right fore seems hanging down at the point of the shoulder. A large swelling develops at that point and spreads rapidly. On examining the shoulder, the animal shows pain. The leg can be moved in abduction and adduction. There seems to be a displacement of the bones about the joint, even crepitation is detected, but only shortly after the accident. Fracture of the glenoid cavity is diagnosed and the mare killed. At the imperfect post mortem that was made there were found fracture of the anterior part of the sternum on a level with the second and third sternebrae, lacerations of muscles, fracture of the second, third and fourth ribs at their sternal articulations.—(*Ibidem.*)

TUBERCULOUS ORCHITIS IN A HORSE [*Major Ch. Darmagnac Army Veterinarian*].—An eight-year-old stallion has swelling of the testicular region. The left testicle is twice its normal size, not painful, not abnormally warm, the gland is adherent to the vaginal serous membrane. Its tissue seems densified and in it a nodule is vaguely felt a little below the epididymis. Rectal examination reveals a spermatic cord hypertrophied in its inguinal portion, but normal above the superior inguinal ring. In general condition the animal is rather poor, but he has good appetite. Temperature is normal. Malleine is injected. Negative results. Tuberculine gives 103 of hyperthermy. Warm painful swelling at the point of injection, general reaction not important, the result is doubtful. Bacilli are found in the sperm, which took the coloration of bacillus of Koch. Diagnosis of tuberculosis is made. The horse is castrated and recovers from the operation. Examination of the testicle shows some twenty tubercles in the tissue of the gland, some of which are in caseous condition. Their contents shows the bacilli in great number. The horse has done excellent work since and improved in general condition.—(*Bullet. de la Soc. Cent.*)

TREATMENT OF PLEURESIS BY INJECTIONS OF AIR [*Major Dr. Bouchet, Army Veterinarian*].—In the presence of the results obtained in human medicine by this treatment the author has thought to demonstrate the innocuity of the introduction of air in the thoracic cavity and principally the possibility of preventing adhesions between the walls of the pleural cavity, adhesions which often render animals that had been affected with pleurisy

unfit for some work. The author records several cases successfully treated by him and in one principally, gives his *modus operandi*.

A mare had pleuresy with effusion; with an apparatus of Potain, 200 grammes of liquid are extracted and 200 c.c. of atmospheric air are introduced. Then repetition of the same process is made with 5 litres of liquid extracted. Croton oil in ether is rubbed on each side of the chest. Three days after, repetition of the thoracentesis, only 3 litres can be extracted. Improvement begins to show. Four days after the second operation, a third thoracentesis removes only 850 grammes of liquid and one litre of air is injected. This was followed by a marked improvement, better appetite, lower temperature, easier breathing dullness almost entirely gone. A cardiac treatment of digitalis completed the recovery of the animal.—(*Ibidem*.)

DR. MICHAEL FORMS NEW VETERINARY ORGANIZATION in Southern Illinois, as the result of his "Get Together" meeting, announced on page 246 of our November issue. Fourteen men eligible for membership were present, and were enthusiastic over the project. After quite an extended clinic, followed by a chicken dinner, an association was organized, and the following set of officers elected. President, Dr. W. Hoehner, Belleville; Vice-President, Dr. Lyle, Porta; Treasurer, Dr. McKinley, Freeburg; and Secretary, Dr. L. B. Michael, Collinville. A committee was appointed to draw up a constitution and by-laws; also one to formulate a code of ethics. The name of the organization will be forwarded to us for our next issue. The next meeting of the organization will be held at O'Fallen on December 20, 1913.

ALL Tennesseans, regardless of their station in life, are extremely sorry to learn that Dr. J. A. Kiernan, U. S. Veterinary Inspector in Charge of Tick Eradication in Tennessee, Alabama and Mississippi is to soon move his headquarters from Nashville, Tennessee, to Birmingham, Alabama. Ticks have been eradicated from 51 counties in Tennessee and the State released from quarantine, hence it became necessary for Dr. Kiernan and his field force to shift their base of operations further south. His work is greatly appreciated by the people among whom he worked. Dr. Kiernan enjoys the distinction of being the first man to demonstrate that it was possible to eradicate ticks from a whole State.

CORRESPONDENCE.

VETERINARIANS AND THE ALLIED HORSE INTERESTS.

SANTA CRUZ, CALIFORNIA.

Editors AMERICAN VETERINARY REVIEW, NEW YORK: Co-operation of the Allied Horse Interests with the farmers could readily double the number of colts in any neighborhood, and when the veterinarians come down off their high horse and realize their chief dependence upon the horse for a good practice, then will they organize the allied horse interests in the country with the dealers and agents selling vehicles and farm machinery, harness and the horseshoers with the veterinarians all dependent upon the horse. This co-operation can go to the bankers and get the money to buy all the draft stallions they want. Then let these veterinarians direct more scientific breeding and management to not only increase the number of colts, but mature them to good horses; see that only the best pure bred stallions are used that are sound and right, that the mares are rightly bred and get in foal, and that proper precaution against "navel ill" is taken to save the useless loss of colts. In all this the veterinarians are the logical leaders that can double the horse breeding in the county, state and nation, that will add more to the prosperity of all classes than all of the grain crops or all of the other stock, well worthy of the steel of the scientific veterinarian to lead in horse breeding as the Government will do nothing to help the farmers in the matter.

The price of good draft horses is so high, and market demands so urgent, we must furnish more good horses to do the work or trucks must be adopted. The automobiles and trucks help the horse but little. Will the veterinarians come to the rescue and help the farmers to raise more horses for better farm teams and more big geldings for the eager market demand?

The veterinarians should either organize an American Allied Horse Association or identify themselves with The National Association of Allied Horse Interests, Trust Building, Providence, R. I.

T. BUTTERWORTH.

JOIN THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

CHICAGO, ILL., NOVEMBER 21, 1913.

Veterinarians of America:

I wish to call the attention of veterinarians not members of the American Veterinary Medical Association to the advantages the association offers and suggest a few of the many reasons why you should join it.

The American Veterinary Medical Association includes in its membership the leading veterinarians of the United States, Canada and the Philippines and the foremost veterinarians and scientists of Europe are among its honored members. A membership in the association will bring you in contact with these men and you can get the best they have to offer. You cannot afford to miss this for it will increase your interest in the profession and help you financially.

The American Veterinary Medical Association has just completed a half century of successful work and gives promise of a more successful future.

Plans are now being perfected for a reorganization of the association that will make it more efficient along all lines.

The American Veterinary Medical Association has taken the lead in attempting to secure legislation that will greatly increase the efficiency of the Army veterinary service and obtain proper recognition of the army veterinarians. This important and greatly needed legislation will soon be passed by Congress.

The American Veterinary Medical Association has been of great assistance in raising the standard of veterinary education and advancing the interests of the profession generally.

The fees are low and you will find the splendid annual reports which you will receive free filled with the latest and best information available along all lines in veterinary science and practice.

I particularly urge upon recent graduates and all others who want to keep right up to date to join the association. It will be of great help to you and you can be of much assistance to the association. Graduates of duly accredited veterinary colleges are eligible to membership. Provision is also made for older graduates in section 4 of the by-laws as follows:

A veterinarian, graduate of a veterinary college, which at the time of his graduation did not maintain educational standards in

conformity with the active membership requirements of this association, may, upon recommendation of the executive committee be elected to membership, provided he has been duly graduated not less than five years prior to the date of application, and further, that the college has now ceased to graduate veterinarians contrary to the standards now fixed by this association.

A list of resident secretaries was published in the November issue of the REVIEW on pages 275-6, and you should write your State secretary for application blanks. If you wish further information regarding the association write the secretary, who will give it prompt attention. Join now and attend the New Orleans meeting in December 1914.

N. S. MAYO,
Secretary.

4753 Ravenswood Ave.

ANSWERS TO QUESTIONS.

On page 262 of the November issue of the REVIEW, three questions are asked. We did not answer them in that issue, as we desired to give our readers the first opportunity, but as no one has answered them through this office we do not know what their answers may have been. We will not republish the questions, but number them, as they can be seen by referring back to the November number. Replying to number (1), it is our opinion that on recovering from the operation referred to, the animal would be rendered infertile, but would not be unsexed.

Replying to number (2), it is our opinion that the operation referred to would have no effect either upon the cow conceiving or carrying the foetus to full term, and that she would be no more predisposed to parturient paresis than a cow with a normal udder.

In regard to number (3), we are inclined to believe that the lymphatic circulation is more susceptible to some forms of invading bacteria than the venous circulation (for example, glanders). This last question we should be glad to have discussed, but feel that there is not much room for discussion of the first two—[Editor.]

DR. GEO. R. WHITE, State Veterinarian of Tennessee, has selected Dr. M. W. Miller, Terre Haute Veterinary College, '13, to take charge of the State Anti Hog Cholera Serum Plant. Dr. Miller's address is 1502 Clinton street, Nashville, Tennessee.

OBITUARY.

GEORGE H. PETERS, M.D.V.

Dr. George H. Peters died at his home in Waltham, Massachusetts, on September 25, 1913, of pneumonia, at the age of 32 years, after an illness of four days. Dr. Peters was born in Waltham in February, 1881, and spent his entire life there. After finishing his high school education, actuated by a love for horses and other animals, which had been instilled in him by association with his father, who for years had trained and driven race horses, he fancied the profession of veterinarian, and entered the McKillip Veterinary College, Chicago; from which institution he graduated in 1906, and immediately engaged in general practice in his home town, continuing to do so up to the time of his sudden taking away. Dr. Peters was unmarried and is survived by a mother, three brothers and a sister. To add to the sad affliction of his family by his loss, his father died the following week, October 3, eight days after his son, in the opinion of the attending physicians, of a broken heart. Dr. Peters and his father will be sadly missed by their townsmen by whom they were much loved. This double bereavement of their family is particularly sad. The home life of both Dr. Peters and his father was very beautiful. Their characters were sunny, generous and charitable, and the mutual devotion between them and the members of their family ideal. The REVIEW, in expressing heartfelt sympathy for the sorrowing family, voices the sentiment of all the profession.

DR. ELMER CRAFT.

"Dr. Elmer Craft, the president-elect of the Utah Veterinary Medical Association, died at his home in American Forks, Utah, Friday, October 17, 1913, from congestion of the lungs, due to exposure while attending the annual meeting of the association October 4 at Salt Lake City. At this meeting Dr. Craft was elected president of the association. He leaves a wife and two

small children. His illness was of so short duration and his taking off so sudden that the news hardly seemed credible to his many friends.

"The association by his death lost a good leader and the profession an ardent supporter.

"This association joins with his many friends in extending heart-felt sympathy to the bereft family."

[NOTE]—The above letter telling of the sudden death of Dr. Craft was received from Secretary Coburn, of the Utah Veterinary Medical Association, almost on top of a previous one enclosing the report of the meeting at Salt Lake City, in which he reported Dr. Craft's election as its chief executive. We have reproduced the letter verbatim. [Ed.]

JAMES LINDSEY ROBERTSON, M.D., V.S., D.V.S.

Just as we were closing our forms we learned of the death of Professor James L. Robertson, in his seventy-first year. Already a graduate in medicine and also in veterinary medicine from the New York College of Veterinary Surgeons, Dr. Robertson graduated from the American Veterinary College in 1876, and held the chair of Theory and Practice of Equine Medicine in that institution from that time until the consolidation of the two schools, which formed the New York-American Veterinary College in 1899, and in the consolidated school up to the time that his health failed a couple of years ago, when he was made Professor Emeritus, which honor he held at the time of his death. During his forty years as a teacher of veterinary medicine he was engaged in general practice and was the ideal practitioner, just as he was the ideal teacher. His thorough knowledge of his subject and his kindly nature won the hearts of all whose privilege it was to have been his students; and he was loved not only by all his students, scattered from one end of the universe to the other, but by every member of the profession whose privilege it was to know him. His practice was principally equine, and his fondness for his patients was beautiful to witness. With these few words of respect to the memory of this grand old man, whose life has been so full of inspiring examples to his fellowmen, we leave the privilege of the writing of an obituary to one who was closely associated with him during the years of his greatest activity and achievements, the senior editor, Professor Liautard, in our January issue.

SOCIETY MEETINGS.

ASSOCIATION OF STATE AND PROVINCIAL VETERINARY COLLEGES.

Annual meeting for 1913 was called to order at the Hotel Astor, New York City, September 2, by Secretary Lyman, he being the senior elective officer present.

The association proceeded to elect temporary officers as follows: Dr. F. S. Schoenleber, president; Dr. L. A. Klein, vice-president; Dr. R. P. Lyman, secretary.

The following veterinarians representing state colleges were present: Dr. Murphy, Iowa State College; Dr. Schoenleber, Kansas State Agricultural College; Dr. Gay, University of Pennsylvania; Dr. Moore, New York State Veterinary College; Dr. Grange, University of Toronto; Dr. Klein, University of Pennsylvania; Dr. Fish, New York State Veterinary College; Dr. Lyman, Michigan Agricultural College; Dr. W. H. Hoskins, University of Pennsylvania; Dr. Cary, Alabama Polytechnic Institute; Dr. Hutton, Michigan Agricultural College; Dr. White, Ohio State University; Dr. Udall, New York State Veterinary College; Dr. Burnett, New York State Veterinary College.

A motion by Dr. Klein was duly made and seconded to hold a meeting at the time of the United States Live Stock Sanitary Meeting in December. Carried.

Dr. Cary presented a report as chairman of the committee on constitution and by-laws. It was regularly moved to receive the report and act upon each section separately. Carried. The constitution was then adopted subject to changes that were made through motions regularly made, seconded and carried, and was adopted as a whole to read as follows:

CONSTITUTION AND BY-LAWS OF THE STATE AND PROVINCIAL ASSOCIATION OF VETERINARY COLLEGES OF AMERICA.

Section I. The object of this association shall be to advance the interests of veterinary colleges in America, and strive for a reasonable degree of uniformity in matriculation, course of study,

faculty and other specific features that are required in the building of the good and growing veterinary college.

Sec. II. The officers of this association shall be a president, three vice-presidents and a secretary-treasurer.

Sec. III. The duties of the officers shall be such as are commonly delegated to them in all similar organizations.

Sec. IV. Every state, provincial or government veterinary college in America shall be entitled to two voting members to be designated by the college represented and as many associate members as shall comply with this constitution and by-laws.

Sec. V. All changes or amendments to the constitution shall be presented in writing at the annual meeting in advance of the one at which it is to be voted on and the secretary-treasurer shall notify each member of the proposed change or amendment before its adoption.

BY-LAWS.

Section I. Order of business:

- (a) Roll call.
- (b) President's annual address.
- (c) Report of secretary-treasurer.
- (d) Report of committees.
- (e) Special or general program of papers and discussions.
- (f) Election of new members.
- (g) Unfinished business.
- (h) New business.
- (i) Miscellaneous business.
- (j) Election of officers.
- (k) Installation of new officers.

Sec. II. The executive committee shall consist of the officers and the duties of this committee shall be to report on all applicants for membership and all other official business not otherwise provided for.

Sec. III. The following committees of three members each shall be appointed annually by the president:

- (a) Committee on veterinary college entrance requirements.
- (b) Committee on curricula.
- (c) Committee on faculties.
- (d) Committee on methods of teaching.

Sec. IV. This association shall meet annually at such time and place as shall be determined by vote of its members, and in case of emergency the executive committee may call a special meeting for a specific purpose. Each member shall be notified

in writing not less than two weeks in advance of the time, giving place and specific purpose of the special meeting.

Sec. V. A majority of the active membership shall constitute a quorum.

Sec. VI. When the association may consider it necessary, dues may be levied not to exceed \$5 annually.

Sec. VII. Changes or amendments to the by-laws shall be presented in writing at least one day in advance of the adoption of the same.

Sec. VIII. Any section of the by-laws may be temporarily suspended by a two-thirds vote.

Dr. D. S. White moved that a copy of the new constitution and by-laws be sent to each college eligible to membership.

Dr. White then read his report as chairman of the committee on entrance requirements. The report reads as follows:

Gentlemen—The standards now recommended by the Council of the American Medical Association prerequisite to the practice of medicine are:

A—Preliminary education must be "sufficient to enable the candidate to enter a recognized university and in addition a course of one or two years devoted to the sciences of physics, chemistry and biology and to modern languages."

B—"Four years of pure medical work, the first two of which should be largely spent in laboratories of anatomy, physiology, pharmacology, etc., and the last two in close contact with patients in dispensaries and hospitals in the study of medicine, surgery, obstetrics and the specialties."

C—"A final year as an interne in a hospital or dispensary should then complete the medical course."

While a college education is recognized as a desirable preparation for a limited number of men, it is not recommended to demand a baccalaureate degree as a minimum requirement to the study of medicine, as this would compel the young medical man to defer the actual beginning of his life's work to an unnecessarily late period—27 or 28 years of age.

Of the 120 medical colleges in the United States 73 (60 per cent.) require a four-year high school education or less, 17 (15 per cent.) require one year of college work and 30 (25 per cent.) colleges are now requiring two or more years of work in a college of arts.

Beginning January 1, 1914, the minimum requirement for admission will be enlarged to include at least one year's college work in physics, chemistry and a reading knowledge of at least

one modern language, besides English, preferably German or French.

Raising the entrance requirements to medical colleges in the United States has been followed by a reduction not only in the number of students studying medicine, but also in the number of medical colleges in the country. In 1904 there were 28,142 students in our medical schools, while in 1912 there were nearly 10,000 less or 18,412. Of these 65 have been closed, 37 by merger and 28 have become extinct. Between 1904 and 1912, however, 15 new medical colleges were organized.

There are on this continent 23 veterinary schools, 21 in the United States and 2 in the Dominion of Canada. All of these but one seem to be recognized by the American Veterinary Medical Association. Of the 21 schools in the United States 12 are private schools, supported entirely by student fees, and 9 are state schools dependent upon national and state aid. Of the 9 state schools in the United States all but one are intimately connected with state universities or colleges and each forming an integral part of a university or college. In Canada the Ontario Veterinary College is now affiliated with the University of Toronto.

During 1912-13 about 2,400 students matriculated in all of the veterinary schools of the United States and about 300 in the two Canadian schools, making a total of 2,700 for the continent. Of the 2,400 students in the schools in the United States 700 were in state and 1,700 in private schools. The average attendance for state schools was 77 students; for private, 141 students.

The length of the course of study in all of the private schools is uniformly three years of seven months each, or a total of twenty-one months, not exclusive of the shorter vacation and examination periods. Of the 9 state schools in the United States four maintain a three-year course of study, and three a four-year course of study. Two offer either a three or four-year course. In all state schools the length of the academic year is nine months, making a total of 27 months of required study in the three and 36 in the four-year schools.

To acquire first-hand information in regard to the present status of entrance requirement at the different state veterinary colleges on this continent, the attached questionnaire was circulated. All colleges made prompt reply and the following data are derived from the answers thus obtained:

The entrance requirements to all private schools, except one, as shown by their catalogues, do not extend beyond the eighth

grade of the grammar school, which fact is partially obscured by using the elusive label "Second Grade Civil Service Examination." In not a single instance is a high school or any part thereof a prerequisite to the study of our profession at these institutions.

On the other hand, all of the state schools but one require some high school training. Assuming that a graduate of a four-year high school is able to offer 15-16 units for entrance to a college, the entrance requirements for the different state schools at present are as follows:

	Units
Alabama Polytechnic Institute	12
Cornell (N. Y. S. V. C.)	15
Colorado State Agricultural College	15
Iowa State College	15
Kansas State Agricultural College	15
Michigan Agricultural College	15
Ohio State University	8
Ontario Veterinary College	4
University of Pennsylvania	0
*Washington State College	8-15

With one exception (Cornell), none of the state schools has its entrance requirement set by state law.

The administration of entrance requirement in eight state schools (counting Washington double) is in the hands of a special board, committee of the general faculty or some officer (at Iowa State the registrar, for instance) not connected with the Veterinary Department. In two schools (Ontario and Pennsylvania) a member of the veterinary faculty administers the entering of students. In these instances the principal and dean respectively assume the responsibility.

Credits from accredited high schools only are accepted in eight schools, leaving only two which accept the graduate of non-accredited high schools.

The effect of raising the entrance requirement to a minimum of 15 units, as given by those who have had actual experience, is as follows:

Alabama reports: "Improvement distinct and good."

Cornell: "Numbers much reduced at first, but the increase is steady."

*Dept., 15 units; school, 8.

NOTE—New York University (N.Y.S.V.C.) not listed above, has same educational standard as Cornell, being regulated by the State Department of Education.—[ED.]

Colorado: "Decreases the number 25 to 50 per cent. Increases quality fully as much. Age about the same. Matured men without basic training eliminated."

Iowa: "Some decrease in number, marked improvement in quality."

Kansas: "Younger but better quality."

Michigan: "Lessens the number, but furnishes a quality of students that can more easily carry on the study incidental to a veterinary career."

Washington: "Splendid effect."

In summary, these replies indicate only one disadvantage to be expected from raising the entrance requirement to a minimum of 15 units, *i. e.*, a decrease in the number of students. The decrease has been found, however, to be only temporary, the number gradually increasing from year to year until a large percent at least of the loss was eliminated.

The question as to whether the entrance requirements should be raised at once or gradually to 15 units was answered as follows: Of the ten schools reporting, eight are in favor of a gradual approach to this standard, while two think it should be done at once.

In considering the hypothetical option between raising the entrance requirement to 15 units and lengthening the course of study to four years, the vote is as follows: Five of the ten schools are in favor of first requiring 15 units for entrance and later lengthening the course of study. Four take the opposite view, and one has not yet given this question sufficient consideration to form an opinion.

SUMMARY.

1. All state schools on the continent but one require for entrance some high school training.

2. Six schools (55 per cent.) (Cornell, Colorado, Iowa, Kansas, Michigan, Washington) already require 15 units of high school work for entrance.

3. Two schools (19 per cent.) (Ohio State and Washington) require eight units.

4. One school (9 per cent.) (Alabama) requires twelve units.

5. One school (9 per cent.) (Ontario) requires four units.

6. One school (9 per cent.) (Pennsylvania) requires at present no high school training of its candidates for matriculation, but promises to do so by demanding eight units on and after 1914.

7. By comparison about the same percentage of state veterinary schools now demand as a minimum for entrance practically the same requirements in force in the majority of medical colleges—55-60 per cent. In 40 per cent. the entrance requirements to medical colleges exceed those to the veterinary schools with the highest minimum entrance standards by one to four years of college work.

RECOMMENDATIONS.

Your committee respectfully recommends:

1. That the minimum entrance requirements be made 15 units (four years) of high school work or its equivalent.
2. That the entrance requirements to all state schools be made uniform as to the character of the high school work presented for entrance in so far as this is feasible.
3. That the 15-unit standard be approached gradually.
4. That beginning September, 1915, the 15-unit standard be instituted in all state veterinary schools on this continent.

(Signed by the Committee.)

During the discussion of the above report Dr. Grange informed the association that the Toronto University, Ontario Veterinary College, would require one year high school, beginning this year.

Dr. Schoenleber, of the Kansas State Agricultural College, informed the association that the Veterinary Department would begin with 15 units in 1913.

Dr. Klein notified the association that the University of Pennsylvania would require 8 units or two years of high school work for entrance in 1914. He stated that he favored the recommendations in the report, but felt that they go too fast for the University of Pennsylvania as regards entrance requirements, as there are so many three-year high schools in the State of Pennsylvania, but that they do hope to go as fast as possible to 12-unit entrance requirements.

Dr. V. A. Moore, New York State Veterinary College, stated that entrance requirements at the institution which he represents is entirely out of his hands, being governed by the State Board of Education. He expressed his opinion that entrance requirements were of the utmost importance and suggested that we accept Dr. White's report as an ideal upon which to work.

Dr. C. A. Cary commented favorably on the report and closed

the debate with the motion to the effect that the American Veterinary Medical Association be requested to print the report as an appendix to the annual publication of the American Veterinary Medical Association. Motion was seconded and carried.

The meeting adjourned to reconvene at 4 p. m. Wednesday.

Wednesday, September 3, 4.40. Meeting called to order by President Schoenleber. In the absence of Dr. Lyman, Dr. Klein was appointed secretary pro tem.

Members present: Drs. Moore, Gill (representing New York State Veterinary College, City of New York), Fitch (New York State Veterinary College, Ithaca, New York), Milks (New York State Veterinary College, Ithaca, New York), Cary, Fish, Blair (New York State Veterinary College, New York City), Ellis (New York State Veterinary College, New York City), Murphy, Schoenleber and Klein.

At the request of Dr. Schoenleber, Dr. Cary explained to the men who had not previously attended the meetings the object of the association.

Dr. Fish moved that the temporary president and secretary as elected Tuesday be made permanent. Seconded and carried.

In order to comply with the constitution and by-laws, Dr. Fish moved that we proceed to the election of three vice-presidents; seconded by Dr. Cary. Carried.

The following were elected by acclamation: Drs. Murphy, Klein and Blair.

Dr. Moore moved that a committee of three be appointed to prepare a bulletin on veterinary education for distribution among the principals of high schools; this to be presented at the special meeting as above provided for in connection with the Live Stock Sanitary Association. Motion was seconded by Dr. Gill. Carried. For this committee the president appointed Drs. Moore, Cary and Glover.

Meeting adjourned.

R. P. LYMAN, Secretary.

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

Meeting was called to order in the rooms of the Chamber of Commerce, Erie, Pennsylvania, September 18, 1913, at 11 a. m., by Dr. Louis A. Klein, president. The association was welcomed to Erie by Mayor Stern in an interesting address

in which he lauded the work of veterinarians and referred to interesting personal experiences with them.

Upon motion by Dr. W. H. Hoskins, Dr. W. S. Gimper was elected temporary secretary in the absence of Dr. John Reichel. Motion to dispense with roll-call carried. Motion to dispense with the reading of the minutes of the previous meeting and to adopt the minutes as issued in printed form, carried.

Dr. Klein announced the death of a former president of this association, Dr. A. W. Wier, Greenville, which occurred on June 23, 1913. The association was represented at the funeral by three members, and a floral offering was made, the receipt of which was acknowledged by letter from the widow and brother. By the death of Dr. Wier a vacancy was left in the Board of Trustees, which was later filled in accordance with the by-laws.

Reports of Delegates to Other Associations.—American Veterinary Medical Association: In the absence of a report from the delegates to this association, Dr. W. H. Hoskins reported the proceedings in a brief but very interesting talk.

He referred to the internal disorders that occurred during the early history of the association and stated that only one of the original members at the 1863 meeting was living at the present time, Dr. Liautard,—unfortunately he could not be present at the anniversary meeting. Reference was also made to the high character of the papers contributed, which were well fitted to the importance of the fiftieth anniversary meeting. There were members or visitors from every state in this country, as well as numerous representatives from foreign countries.

Dr. Hoskins referred to the election of Dr. C. J. Marshall showing appreciation of his valued services during the three years in which he was secretary of the organization.

The fiftieth anniversary meeting was conceded to be a great success in every way.

The newly elected president of the American Veterinary Medical Association was then called upon to favor us with a talk.

He stated that the association has been going forward with great strides during the past ten years. The membership has been increasing by two hundred to three hundred members each year, until at the present time there are approximately two thousand members enrolled. Every state in this country and every province in Canada is represented in the membership. Representative members of the profession in every section are members of the American Veterinary Medical Association.

The next meeting will probably be held at New Orleans during the Christmas holidays of 1914. Dr. Marshall concluded his talk with a few feeling remarks appreciative of his election and asked that all members make special efforts to attend the New Orleans meeting and give the association a good start on the second half of its century run.

Reports of Delegates to the Federation of Allied Agricultural Interests.—Dr. Klein, chairman, stated our association must join the Federation before the delegates can attend the meetings and vote. No notice of such election has as yet been received. Dr. Klein is hopeful that our State Veterinary Medical Association will be given membership in the Allied Associations, as it is greatly to the interest of the veterinary profession to be in close touch with all matters relating to agriculture. The applications of new members were then received.

As Dr. C. J. Marshall was the only member of the board of trustees present, President Klein appointed Drs. Chrisman, Irons and Greenfield to act as members of the board of trustees at this meeting.

A report from the committee on army legislation was then made by Dr. W. H. Hoskins.

Dr. Hoskins reported considerable progress. He feels confident the bill will pass the House of Representatives; but a severe battle will have to be fought in the Senate, but it will be under more favorable conditions than formerly.

There being no other committee reports and no unfinished business, the collection of dues was in order.

Following this, the board of trustees announced they had acted favorably on the applications for membership received as follows:

Dr. C. Courtney, McLean, Meadville; Dr. A. J. Mitchell, Jr., Erie; Dr. E. Greene, Cambridge Springs; Dr. R. M. Quigley, Tyrone; Dr. C. B. Palmer, Easton; Dr. James B. Hardenbergh, Philadelphia, and Dr. John Bryce, Erie.

Upon motion, the rules were suspended, the report of the committee accepted and the secretary instructed to cast a vote collectively electing all applicants to membership. Pursuant to this motion President Klein declared the seven applicants elected to membership.

Dr. C. J. Marshall, state veterinarian and secretary of the Pennsylvania State Live Stock Sanitary Board, then gave an interesting and exhaustive address in reference to recent legisla-

tion and outlined the future policies of the board in handling the subject of tuberculosis, stating that the act of March 25, 1903, known as the Butcher's Indemnity Act, was repealed. Two bills relating principally to milk and meat hygiene were defeated, but one bill which is of general interest was passed.

He referred to certain questionable practices which had led to the repeal of the Butcher's Indemnity Act and referred in particular to an organization known as the Pennsylvania State Cattlemen's Association and the desire of this association to have legislation enacted which would have raised the state indemnity to an impractical amount.

As regards milk hygiene legislation, this subject seems to be very unpopular during the last session, and the bill was defeated.

The feeding of offal and refuse on the premises of slaughter houses is against the regulations of the State Live Stock Sanitary Board. A bill to make this unlawful was offered in the legislature, but met with defeat. At this point the meeting adjourned for lunch.

The afternoon session was called to order at 2.30 p. m., and Dr. Marshall resumed his address by discussing the act which was approved July 22, 1913.

This act gives the board jurisdiction over the diseases of poultry. It requires veterinarians to report certain diseases affecting various animals. It strengthens the board's power in establishing quarantines and modifies the requirements governing the interstate movement of cattle. By this modification foreign cattle intended for shipment into Pennsylvania should be inspected and tested before being brought into the state. Otherwise they may be brought in only under supervision of a member, officer or agent of the board after due notice of such shipment has been given. When cattle have been brought in under this clause, they are inspected and tested by duly appointed agents of the board at the expense of the state.

The permit system which was formerly in vogue, allowing cattle to be brought in under quarantine to be tested at destination, has been discontinued.

At this point the speaker digressed from the subject of new legislation and referred to the policies adopted by the board in handling tuberculin tests on native cattle.

During the past few years it has been customary, as far as funds would permit, to make such tests at the expense of the commonwealth. The herd owners were required to sign an application in the form of a contract, agreeing to certain things. It

practically usurped the control of their herds and placed them under the jurisdiction of the board until the terms of the contract had been complied with. This procedure has in many instances resulted in situations very embarrassing to both the owner and the board. The herd owners would not read the contract carefully and were not aware of the obligations which they were assuming.

In view of this dissatisfaction and the embarrassment resulting from the present attitude of the state auditor general, in refusing to pay indemnity vouchers, it has been decided for the present at least, to discontinue the testing of native herds at state expense.

When an owner desires to rid his herd of tuberculosis by having it tested by a competent veterinarian at his own expense, all possible assistance will be rendered him as formerly.

Dr. Marshall then referred to other requirements of the new law which governs the sales and use of biological products; permits the branding of reacting cattle, and compels the pasteurization of skim milk and separator slop before being returned to the farmers to be fed to calves and swine. This last feature is of special importance from the economical standpoint as well as in relation to animal's health. Each year thousands of carcasses of cattle and swine are condemned by reason of being extensively affected by tuberculosis. Exhaustive investigations have proven that a very large percentage of these conditions is due to feeding of skim milk from tuberculous cattle. The point has been reached where it becomes necessary to conserve our meat supply. The condemnation of these tuberculous carcasses has a visible effect in reducing the general supply, and it becomes necessary to remove one of the prolific sources of reduction by compelling the proper pasteurization of skim milk and separator slop before being fed to young animals.

Other prolific sources for the dissemination of tuberculosis are the practice of feeding swine behind tuberculous cows and feeding uncooked slaughter-house offal to hogs.

Following Dr. Marshall's address, a lively discussion ensued, the members showing a keen interest in upholding and extending the work of the board.

A paper entitled "Phenol in the Treatment of Tetanus," contributed by Dr. Victor G. Kimball, of Philadelphia, was read by Dr. M. J. Chrisman.

This was followed by a statistical statement of the results obtained in Pennsylvania in the testing of native and interstate

cattle during the year 1912 as compared with the average results obtained during the preceding fourteen years by Dr. W. S. Gimper.

Dr. H. T. Goetz, of Buffalo, was called upon by the president to relate interesting experiences in the use of cannabis.

He stated much better results had been obtained by highly diluting cannabis extract with diluted alcohol.

It was necessary to omit several papers, owing to the absence of the contributors, and Dr. Gimper was called upon to give a brief outline of the legal proceedings instituted by the board to recover money paid by the state to the owners of a herd which had been tested at state expense under the form of contract previously referred to by Dr. Marshall.

In this case civil suit for recovery had been instituted, judgment was given in favor of the commonwealth for the full amount of indemnity paid with interest and costs. The decision of the court in this case influenced somewhat the proposed change in the method of handling tuberculin tests on native cattle at state expense.

Under the head of new business, Dr. J. B. Irons, of Erie, was elected to fill the unexpired term of Dr. A. W. Wier.

On motion by Dr. D. B. Fitzpatrick, an unanimous and hearty vote of thanks was tendered the local committee of arrangements.

On motion of Dr. Bryce, a vote of thanks was tendered the Erie Chamber of Commerce for the use of the meeting room.

On motion the meeting was declared adjourned at 5 p. m.

It was the consensus of opinion that this meeting was one of the pleasantest and most successful semi-annual meetings held in recent years, thirty-seven members and visitors being present.

W. S. GIMPER, Secretary *pro tem*.

ALUMNI ASSOCIATION OF THE NEW YORK-AMERICAN VETERINARY COLLEGE.

A special meeting of the Alumni Association of the New York-American Veterinary College was held September 3, 1913, at the Hotel Astor, New York City. The president, Dr. Chas. S. Chase, of Bay Shore, occupying the chair. In the absence of the secretary, Dr. Percival K. Nichols, Dr. J. Payne Lowe, of Passaic, N. J., was elected secretary *pro tem*.

Owing to the fact that the Fiftieth Anniversary Meeting of

the American Veterinary Medical Association was in progress, a large number of the alumni were present; the following were in attendance: W. H. Gribble, Washington Court House, Ohio (A. V. C., 1884); Lester H. Howard, Boston, Mass. (A. V. C., 1882); Warren L. Rhodes, Lansdowne, Pa. (A. V. C., 1893); David W. Cochran, New York City (Columbia V. C., 1879); Geo. H. Berns, Brooklyn, N. Y. (Columbia V. C., 1879); Maffitt Smith, New York City (N. Y.-A. V. C., 1903); W. J. McKinney, Brooklyn, N. Y. (N. Y. C. V. S., 1898); Chas. S. Chase, Bay Shore, N. Y. (N. Y.-A. V. C., 1906); U. S. G. Bieber (A. V. C., 1891); J. W. Scheibler, Memphis, Tenn. (A. V. C., 1885); John D. Fair, Millersburg, O. (A. V. C., 1887); Wallace F. Vail, Greenwich, Conn. (N. Y.-A. V. C., 1905); Robert W. Ellis, New York City (A. V. C., 1889); John C. Meyer, Cincinnati, Ohio (A. V. C., 1876); David McAuslin, Brooklyn, N. Y. (N. Y.-A. V. C., 1907); W. Horace Hoskins, Philadelphia, Pa. (A. V. C., 1881); E. B. Ackerman, Brooklyn, N. Y. (A. V. C., 1891); J. Payne Lowe, Passaic, N. J. (A. V. C., 1891); R. H. Kingston, New York City (N. Y.-A. V. C., 1904); Henry Cady, Gloversville, N. Y. (A. V. C., 1887); James T. Glennon, Newark, N. J. (N. Y. C. V. S., 1896); Geo. W. Smith, Hoboken, N. J. (N. Y.-A. V. C., 1903); R. F. Meiners, Boonton, N. J. (N. Y.-A. V. C., 1899); Thos. E. Smith, Jersey City, N. J. (N. Y. C. V. S., 1897); Louis J. Beloff, New Brunswick, N. J. (N. Y.-A. V. C., 1902); John B. Hopper, Ridgewood, N. J. (A. V. C., 1892); Wilfred F. Harrison, Bloomfield, N. J. (A. V. C., 1887); Thomas C. Maloney, Fall River, Mass. (N. Y. C. V. S., 1889); Jos. A. De Groodt, Morristown, N. J. (N. Y.-A. V. C., 1913); Wilbur B. Maxson, New York City (N. Y.-A. V. C., 1911); C. R. Borden, 7 Adams St., Taunton, Mass. (A. V. C., 1892); Chas. W. Shaw, New York City (A. V. C., 1892); Frederick P. Ruhl, Milford, Del. (A. V. C., 1885); Frank P. Dorian, Yonkers, N. Y. (A. V. C., 1893); H. B. Cox, Philadelphia, Pa. (A. V. C., 1895); W. G. Hollingworth, Utica, N. Y. (A. V. C., 1884); M. W. Drake, Philadelphia, Pa. (A. V. C., 1890); Edw. F. Koehler, Easton, Pa. (A. V. C., 1890); Arthur L. Grover, New York City (A. V. C., 1897); Geo. W. Meyer, New York City (A. V. C., 1891); Samuel Atchison, Brooklyn, N. Y. (N. Y. C. V. S., 1887).

The president stated that the object of calling the special meeting was to get together a large number of the alumni and stimulate them into activity. He told of the passage of an act known as Chapter 676 of the Laws of 1913, whereby the New

York-American Veterinary College was adopted by the State of New York, under the title of the New York State Veterinary College, established at New York University in the City of New York.

He spoke of the responsibility and duty of each alumnus to his alma-mater, and asked for united support, and regular attendance at the meetings, so that the association will become a power, and meet the problems which confront it in its new era.

Dr. W. Horace Hoskins and others spoke, and gave their views as to how the association could be awakened into active usefulness.

The advisability of the association publishing an alumni history was freely discussed, different members present volunteered to write the history of their respective classes.

The following motion was voted upon and carried. "That the present officers of the alumni association, in connection with ten members, constitute themselves a committee to get up a history of the alumni of the A. V. C., the N. Y. C. V. S. and the N. Y.-A. V. C., the president to appoint the said ten members at his convenience. Moved and seconded that we authorize the officers to suspend the by-laws, so that the president may call a special meeting annually during the progress of the A. V. M. A. meeting—carried.

Moved and seconded that the President appoint a Committee to revise the present constitution and by-laws—carried. The president appointed the following: Dr. H. D. Gill, chairman; Drs. Ellis, Cochran, Smith (Thos.), Berns and Ackerman.

The following contributions were received (see above list). Total, \$41. Moved and seconded to adjourn—carried.

J. PAYNE LOWE, Secy. *Pro. Tem.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

(October Meeting).

The regular monthly meeting of this association was called to order by President McKinney at 8.45 p. m.

The minutes of the June meeting were read and approved.

The prosecuting committee reported progress.

The president then called for the reports of the delegates to

the A. V. M. A. and the New York State Veterinary Medical Society.

Drs. Ellis and Blair gave a concise report of both meetings.

Dr. Louis Griessman, of New York City, then read a paper entitled, "Unfair Competition and Its Evils."

This paper was productive of quite a discussion, and several members and visitors expressed their views of the best means of dealing with illegal practitioners and veterinarians who underbid their fellow practitioners.

Dr. T. E. Smith, of Jersey City, stated that in Jersey City they had from time to time prosecuted illegal practitioners, but that the real object of our veterinary associations should be the advancement of the profession and the banding together of its members. Also said that in his opinion it would be better to educate the public on different lines by the example of better work done by qualified men, thus causing the public to repudiate the quack. Said that we should not be too grasping for a dollar, and illustrated his point of view by a story told in his own inimitable way.

Dr. DeVine said that he agreed with Dr. Smith, and thought it best that a prosecuting committee pick their cases, and thus avoid adverse criticism. Action should be taken first against intemperate, disgraceful or vicious persons who are violators of the law.

There was also a general discussion on Dr. Griessman's reference to undercharging by certain practitioners, and it was urged that such cases be investigated and some action taken.

Dr. DeVine then stated that the Commissioner of Agriculture had asked him to confer with the New York City veterinarians regarding the glanders situation, and stated that at a conference of State and City veterinarians the following recommendations were adopted:

First—The licensing of all stables.

Second—A disinfecting corps to be attached to the regular veterinary staff.

Third—That the ordinance relating to the tagging of all animals sent to the offal dock be rigidly enforced, thus making it easy to trace a diseased animal.

Fourth—That a competent pathologist be stationed at the offal dock.

Fifth—That all reactors to the recognized tests be properly identified in some way.

Sixth—That the use of mallein and vaccine should be re-

stricted to the official veterinarians, or, if used by others, under their supervision and co-operation.

Seventh—That the owner in all cases be represented by his own veterinarian.

Dr. McKinney stated that in his judgment the recommendations were excellent.

Dr. R. W. Ellis also spoke in favor of the same, and moved that they be endorsed by this association; seconded and unanimously carried.

A general discussion of the sera tests for glanders then took place, in which a number of those present took part. The eye test was also discussed, and Dr. Kingston stated that he had excellent results with the same. Advocates the use of the brush in applying the concentrated mallein to the eye.

Several papers were promised for the next meeting.

No further business appearing, the meeting adjourned.

R. S. MACKELLAR, Secretary.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular meeting of the above association was held at Young's Hotel, Boston, Wednesday evening, September 24, 1913. Members present were: Drs. Burr, Dodge, Draper, Emerson, Peirce, Seale, Simpson, Stanbridge, Robinson, Winchester and Pugh; and as guest, Dr. F. H. Slack, of the Boston Board of Health, who read a most excellent paper,* the subject of which was, "The Significance of Pus and Streptococci in Milk."

In the absence of President Perry, First Vice-President Seale took the chair and called the meeting to order at 5.40 p. m. A motion was made by Dr. Emerson, seconded by Dr. Peirce, that reading of the records of the previous meeting be deferred until Dr. Slack had read his paper. Carried. Dr. Burr then introduced Dr. Slack. At the conclusion of his paper, Dr. Slack was tendered a hearty vote of thanks; and from the keen discussion which followed, his subject proved to be intensely interesting. The secretary then read the minutes of the previous meeting and outing, which were accepted.

Dr. Robinson then moved, seconded by Dr. Simpson, that the meeting adjourn.

W. T. PUGH, Secretary.

* Will be published in our next issue.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of K. V. M. A. was held on Tuesday evening, November 11, 1913, in Donaldson's Hall. The meeting was called to order by President Yunker, and about twenty-five members were present.

The first essayist for the evening was Dr. Geo. W. Pope, of the B. A. I., who read a very interesting paper on "Our Increased Knowledge Concerning the Nature of Animal Diseases." He showed what was known thirty years ago about Veterinary Medicine, also the mysteries which baffled the men of that time. Then he took up the principle diseases and showed the remarkable progress that we have made in the studying of these diseases.

The next subject to be considered was "The Importation and Breeding of Draft Horses in Pennsylvania," by Dr. Carl W. Gay.

He showed clearly how Pennsylvania could be made one of the chief draft breeding States in the Union; that it possessed the land, climatic conditions and feeding facilities.

There were two men admitted to membership: Dr. Victor G. Kimball and Dr. Francis Murphy. Adjournment.

CHESTON M. HOSKINS, Secretary.

UTAH VETERINARY MEDICAL ASSOCIATION.

The fourth annual meeting of the above association was held in the Commercial Club Building in Salt Lake City, October 4, 1913, at which the following resolution was passed:

Be it resolved that the Utah Veterinary Medical Association hereby appeal to the state authorities that only qualified graduate veterinarians be allowed to apply the mallein and tuberculin tests for all state and expert purposes.

And be it further resolved that a copy of this resolution be sent to the Governor of the state, the State Live Stock Inspector and the State Board of Sheep Commissioners.

The following members were elected as officers for the ensuing year: President, Dr. Elmer, of American Forks; vice-president, Dr. A. J. Webb, of Ogden; secretary and treasurer, Dr. E. P. Coburn, of Brigham City.

The outgoing officers were: Dr. Walter Emms, of Salt Lake City, president; Dr. Arch Egbert, of Logan, vice-president, and Dr. R. H. Haggan, of Richfield, secretary and treasurer.

Salt Lake City was the place selected for the semi-annual meeting next spring, and an interesting program is promised.

E. P. COBURN, D.V.M., Secretary and Treasurer.

CONNECTICUT VETERINARY MEDICAL ASSOCIATION.

The semi-annual meeting of the above association was held in Waterbury, August 6, 1913. The day was devoted to clinics at Dr. Thos. Bland's hospital. There were many interesting and instructive cases presented for examination and diagnosis. Among the operations performed were four cases of roaring and two cases of oophorectomy in mares, which presented excellent prospects of good results from the operations.

In the evening a banquet was held at Hotel Elton. Following the banquet the business meeting was held. After the business had been transacted the following papers were presented: * Impaction of the Cecum in the horse, by Dr. A. T. Gilyard; * Hog Cholera Serum in Practice, by Dr. Chas. L. Colton. The papers were very interesting and the discussion of them brought out many instructive features.

The following members were in attendance: Drs. Thos. Bland, H. E. Bates, H. C. Balzer, C. H. Beere, G. T. Crowley, C. L. Colton, F. D. Coles, G. L. Cheney, G. E. Corwin, Jr., B. K. Dow, P. F. Finnigan, J. J. Flaherty, A. T. Gilyard, L. B. Judson, V. M. Knapp, A. C. Knapp, P. T. Keeley, G. W. Loveland, J. J. Moynahan, E. H. Morris, F. D. Monell, B. D. Radcliff, E. C. Ross, J. S. Schofield, E. F. Schofield, A. W. Sutherland, Oscar Schreck, R. S. Todd, J. E. Underhill, H. Whitney, I. R. Vail and honorary member, H. O. Averill. Vistors, Drs. T. S. Childs, B. D. Pierce, A. McHugh, R. P. Lyman, J. F. Laden, also several friends of the members.

B. K. Dow,
Secretary.

* Will be published in the next issue.

SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.—Secretary Huyet, of Wernersville, Pa., announces next meeting of this association at Reading, Pa., December 17, 1913.

KANSAS VETERINARY MEDICAL ASSOCIATION.—Secretary Burt, of Manhattan, announces the tenth annual meeting of this association at that place January 6, 7 and 8, 1914, and wants every veterinarian in Kansas to be present.

NEWS AND ITEMS.

RULING AS TO COCAINE PRESCRIPTIONS.

To the Editor of the ERA:

I am enclosing herewith an opinion rendered by the Attorney-General relative to rights of dentists and veterinarians in regard to writing prescriptions containing cocaine or eucaine under the present law enacted by the present Legislature. This opinion was asked for in response to an inquiry from a licensed veterinarian in which he stated a prescription that he had written was refused to be filled by a licensed pharmacist.

Very truly yours,

WARREN L. BRADT,
Secretary State Board of Pharmacy.

Albany, July 8, 1913.

PENAL LAW, SECTION 1746.—SALE OF COCAINE.—PURCHASE VETERINARIAN.

Veterinarians may not purchase cocaine of a druggist except in the original package, nor may prescriptions signed by them be filled.

INQUIRY.

A veterinarian presents to a druggist a prescription calling for cocaine "to be used by veterinarian." May the druggist under the amendment made this year to Section 1746 of the Penal Law fill this prescription?

OPINION.

An elaborate scheme for the control of the sale and possession of cocaine and its products is provided by the statute. Sales may be made only to certain classes of persons, in the original packages, and in limited amounts. The classes to whom such sales may be made are pharmacists, druggists, including both manufacturers and dealers, physicians, veterinarians and dentists. Every sale must be recorded, with full details as to amount,

date, and name of purchaser, and all cocaine purchased must be kept, with two exceptions, in a place specified in the record of sale. The two exceptions as to keeping the drug in a specified place are of sales under physicians' prescriptions and of certain limited quantities which may be carried by a physician, veterinarian or dentist for use in his profession.

No provision is made for the filling of prescriptions by dentists or veterinarians, and such use of the drug as these two classes may make in their profession is therefore limited to that of direct personal administration. An attempt by a dentist or veterinarian to use the drug by means of a prescription to be filled by a druggist is penalized by making it a misdemeanor for anyone not of the class specifically authorized, to have any of it in his possession, without the certificate of the person making the sale, stating the name and address of the physician upon whose prescription the sale is made.

I am therefore of the opinion that a druggist is not authorized to fill a prescription calling for cocaine, signed by a dentist or veterinarian, and that the right of dentists and veterinarians to use the drug is limited to its purchase in original packages and direct administration to the patient.

Dated July 2, 1913.

(Signed) THOMAS CARMODY,
Attorney-General.
—*The Pharmaceutical Era*, August, 1913.

URUGUAY VETERINARY COLLEGE.

[Consul Frederic W. Goding, Montevideo.]

It is now seven years since Dr. D. E. Salmon, the American veterinary expert, was engaged by the Government of Uruguay to organize a faculty and frame plans for a college of veterinary medicine and surgery. Dr. Salmon completed his work in a most satisfactory and able manner, remaining one year longer than his contract called for, the result being one of the largest, best equipped, and most modern institutions of its class in existence.

The most important industry here—live-stock breeding—demanded a change from the former rudimentary and empirical methods of treating diseased animals, as well as better sanitary methods of inspection for the meats produced in the country, which had found good markets in foreign countries, and required

the most thorough scientific inspection in order to inspire confidence in them as wholesome food materials. Hence, one of the prime objects of the college was the training of young men for that work.

Instruction has heretofore been given in rented buildings, but recently the college and all its appurtenances was moved to the splendid structures planned and supervised by Dr. Salmon, which will remain a monument to commemorate the splendid services rendered by him to scientific education in this Republic. They are located on an estate of 30 acres, in Larranaga Street, in the outskirts of Montevideo. The buildings include the main building, in which are lecture rooms, classrooms, laboratories for pathological and parasitological anatomy, bacteriology, and experimental medicine, with photographic cabinet, and other annexes; the hospital, with the upper floor devoted to the library, the ground floor to the pharmacy, the medical and operating clinics, the outdoor consulting room, cabinets for hydrotherapeutics and electrotherapeutics, box stalls for sick horses and cattle, cages for dogs, other small animals, and fowls. Other than these are the buildings for anatomy dissections, and slaughter, under construction and nearly completed, and those for forage, ambulances, and blacksmith shop are to be built. The plans also include a hospital for animals and one for contagious diseases.

For a very moderate fee in the public hospital are received all classes of sick animals, the consultations and medicines being free.

A provisional program of studies has been heretofore followed, but, beginning with the year 1914, a bachelor's degree will be required for matriculation, except only the graduates from the Military College, who will be admitted on the diploma of that institution. The new course of study is as follows:

First Year—Anatomy of domesticated animals; dissections; normal histology and microscopy; embryology and teratology; medical physics and chemistry.

Second Year—Physiology; external anatomy of domesticated animals; general zootechnics; parasitology; general pathology; propedentic clinics; materia medica and pharmacology.

Third Year—Medical pathology and clinics; surgical pathology and clinics; topographic anatomy; operative medicine and horseshoeing; general anatomy and pathological histology; special zootechnics and autopsy technique; microbiology.

Fourth Year—Contagious diseases and sanitary police; inspection of meats and milk; medical and surgical pathology; obstetrics; hygiene; special pathological anatomy and legal medicine; toxicology and jurisprudence.—(From *Daily Consular and Trade Reports*, Washington, D. C.; by courtesy of Dr. A. M. Farrington, B. A. I., U. S. Department of Agriculture.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	June 6-7, 1913.	Birmingham.....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1914.	141 W. 54th St.....	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.....	Dec., 28-31, 1914.....	New Orleans, La.....	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n.....	January, 1914.....	Ft. Smith.....	J. B. Arthur, Russellville.
Ass'n Médeciale Veterinaire Française. "Laval".....	1st and 3d Thur. of each month.....	Lec. Room, La- val Un'y, Mon. Chicago.....	J. P. A. Houde, Montreal. H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	S. Omaha, Neb.....	E. J. Jackson, So. Omaha.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	St. Joseph and vicinity.....	F. W. Caldwell, St. Joseph, Mo.
Buchanan Co. Vet. Ass'n.....	Monthly.....	San Francisco.....	John F. McKenna, Fresno.
California State V. M. Ass'n.....	December 10, 1913.....	Ottawa.....	A. E. James, Ottawa.
Central Canada V. Ass'n.....	Feb. and July.....	Syracuse.....	W. B. Switzer, Oswego.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Chicago.....	D. M. Campbell, Chicago
Colorado Veterinary Society.....	2d Tues. each month.....	Ft. Collins.....	I. E. Newsom, Ft. Collins.
Colorado State V. M. Ass'n.....	May 28-29, 1913.....	Waterbury.....	B. K. Dow, Williamantic.
Connecticut V. M. Ass'n.....	August 6, 1913.....	Wilmington.....	A. S. Houchin, Newark, Del.
Delaware State Vet. Society.....	Jan., Apl., July, Oct.....	Newark, N. J.....	J. F. Carey, East Orange, N. J.
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Rochester.....	J. H. Taylor, Henrietta.
Genesee Valley V. M. Ass'n.....	2d week, July, 1913.....	Atlanta.....	P. F. Bahnsen, Americus.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Wash., D. C.....	A. T. Ayers.
V. M. A. of Geo. Wash. Un'y.....	2d Sat. each month.....	Chicago.....	Louis P. Cook, Cincinnati.
Hamilton Co. (Ohio) V. A.....	December, 1913.....	Indianapolis.....	L. A. Merillat, Chicago.
Illinois State V. M. Ass'n.....	Jan. 14, 1914.....	Pending.....	A. F. Nelson, Indianapolis.
Indiana Veterinary Association.....	Pending.....	Manhattan.....	C. H. Stange, Ames.
Iowa Veterinary Ass'n.....	Jan. 6-7-8, 1914.....	Lexington.....	J. H. Burt, Manhattan.
Kansas State V. M. Ass'n.....	Oct. & Feb. each year.....	Philadelphia.....	Robert Graham, Lexington.
Kentucky V. M. Ass'n.....	2d Tues. each month.....	Pending.....	Cheston M. Hoskins.
Keystone V. M. Ass'n.....	Pending.....	Lake Charles.....	Phil. H. Fulstow, Norwalk, Ohio.
Lake Erie V. M. Association.....	Sept., 1913.....	Portland.....	Hamlet Moore, New Orleans, La.
Louisiana State V. M. Ass'n.....	Jan. 14, 1914.....	Baltimore.....	H. B. Wescott, Portland.
Maine Vet. Med. Ass'n.....	4th Wed. each month.....	Young's, Boston.....	H. H. Counsellman, Sec'y.
Maryland State Vet. Society.....	Feb. 3, 4, 1914.....	Lansing.....	J. H. Seale, Salem.
Massachusetts Vet. Ass'n.....	Jan. 14-15-16, 1914.....	St. Paul.....	W. A. Ewalt, Mt. Clemens.
Michigan State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	G. Ed. Leech, Winona.
Minnesota State V. M. Ass'n.....	June 30, July 1-2, '13.....	Omaha.....	Wm. P. Ferguson, Grenada.
Mississippi State V. M. Ass'n.....	July, 1913.....	Kirksville.....	Hal. C. Simpson, Denison, Ia.
Missouri Valley V. Ass'n.....	Sept. 24, 25, 1913.....	Helena.....	S. Stewart, Kansas City.
Missouri Vet. Med. Ass'n.....	1st Mo. & Tu., Dec. 13.....	Lincoln, Neb.....	A. D. Knowles, Livingston.
Montana State V. M. A.....	Sept., 1914.....	Rochester.....	Carl J. Norden, Nebraska City.
Nebraska V. M. Ass'n.....	June, 1914.....	Wilson.....	H. J. Milks, Ithaca, N. Y.
New York S. V. M. Soc'y.....	Aug. 6-7, 1913.....	Fargo.....	J. P. Spoon, Burlington.
North Carolina V. M. Ass'n.....	Nov. 1913.....	Delfhos.....	C. H. Babcock, New Rockford.
North Dakota V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	E. V. Hover, Delfhos.
North-Western Ohio V. M. A.....	Annually.....	Upper Sandusky.....	Reuben Hilty, Toledo.
Ohio State V. M. Ass'n.....	Fall, 1913.....	Oklahoma City.....	F. F. Sheets, Van Wert, Ohio.
Ohio Soc. of Comparative Med.....	1st Week in Feb. 1914.....	Toronto.....	J. C. Howard, Sullivan.
Ohio Valley Vet. Med. Ass'n.....	Sept. 16, 1913.....	Not selected.....	C. E. Steel, Oklahoma City.
Oklahoma V. M. Ass'n.....	Call of President.....	Manila.....	L. A. Willson, Toronto.
Ontario Vet. Ass'n.....	4th Tues. each month.....	Portland, Ore.....	John Reichel, Glensiden.
Pennsylvania State V. M. A.....	Mon. and Que.....	Providence.....	David C. Kretzer, Manila.
Philadelphia V. M. A.....	Pending.....	Fillmore.....	Sam. B. Foster, Portland, Ore.
Portland Vet. Med. Ass'n.....	Aug. 5-6-7 1913.....	St. Louis.....	Gustave Boyer, Rigaud, P. Q.
Province of Quebec V. M. A.....	1st Wed. fol. the 2d Sun. each month.....	Reading.....	J. S. Pollard, Providence.
Rhode Island V. M. Ass'n.....	Dec. 17, 1913.....	Philadelphia.....	B. K. McInnes, Charleston.
South Carolina Ass'n of Veter'ns.....	Pending.....	Madison.....	F. Hockman, Iola.
South Illinois V. M. and Surg. Ass'n.....	Jan., Apl., July, Oct.....	Los Angeles.....	Wm. T. Conway, St. Louis, Mo.
St. Louis Soc. of Vet. Inspectors.....	4th Tues. each month November, 1914.....	407 Illinois Ave.....	W. G. Huyett, Wernersville.
Schuykill Valley V. M. A.....	Nov., 1913.....	College Station.....	B. T. Woodward, Wash'n, D. C.
Soc. Vet. Alumni Univ. Penn.....	2d Thu. each month.....	St. P.-Minneapolis.....	S. W. Allen, Watertown.
South Dakota V. M. A.....	Spring of 1914.....	Salt Lake City.....	J. A. Dell, Los Angeles.
Southern Aux. of Cal. S. V. M. Ass'n.....	Jan. 1914.....	Walla Walla.....	H. R. Collins, South St. Joseph.
South St. Joseph Ass'n of Vet. Insp.....	3d Thu. each month.....	Pittsburgh.....	O. L. McMahon, Columbia.
Tennessee Vet. Med. Ass'n.....	July 10, 1913.....	Milwaukee.....	Allen J. Foster, Marshall.
Texas V. M. Ass'n.....	June, Sept., Dec., Mar.....	York.....	S. H. Ward, St. Paul, Minn.
Twin City V. M. Ass'n.....	3d Wed. each month.....	Jersey City.....	E. J. Coburn, Brigham City.
Utah Vet. Med. Ass'n.....	Feb. & July each yr.....	Jersey City.....	G. T. Stevenson, Burlington.
Vermont Vet. Med. Ass'n.....	July 10, 1913.....	Jersey City.....	C. H. H. Sweetapple, For. Saskat- chewan, Alta, Can.
Veterinary Ass'n of Alberta.....	1st Wed. each month.....	Jersey City.....	M. Page Smith, Washington, D. C.
Vet. Ass'n Dist. of Columbia.....	July 10, 1913.....	Jersey City.....	Wm. Hilton, Winnipeg.
Vet. Ass'n of Manitoba.....	1st Wed. each month.....	Jersey City.....	E. L. Loblein, New Brunswick.
Vet. Med. Ass'n of N. J.....	Monthly.....	Jersey City.....	R. S. MacKellar, N. Y. City.
V. M. Ass'n, New York City.....	July 10, 1913.....	Jersey City.....	T. F. O'Dea Union Hill, N. J.
Veterinary Practitioners' Club.....	1st & 3d Fri. Eve.....	Jersey City.....	Geo. C. Faville, North Emporia.
Virginia State V. M. Ass'n.....	June 1914.....	Jersey City.....	R. J. Donohue, Pullman.
Washington State Col. V. M. A.....	3d Thu. each month.....	Jersey City.....	Carl Cozier, Bellingham.
Washington State V. M. A.....	July 16-17, 1913.....	Jersey City.....	Benjamin Gunner, Sewickley.
Western Penn. V. M. Ass'n.....	June, Sept., Dec., Mar.....	Jersey City.....	J. W. Beckwith, Shallsburg.
Wisconsin Soc. Vet. Grad.....	June, Sept., Dec., Mar.....	Jersey City.....	E. S. Bausticker, York, Pa.
York Co. (Pa.) V. M. A.....			

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. **Make all checks or P. O. orders payable to American Veterinary Review.**

THE COUGH SEASON is here and veterinarians should be stocked up in anticipation of the coughs and colds that it surely brings. "TERP. HEROIN AND DROSER A FOSTER'S" has given splendid satisfaction in bronchial and pneumonic affections, laryngitis, and all forms of colds. See their announcement on page 11 (adv. dept.) of this issue, and write them for particulars, mentioning the REVIEW.

A MOST COMPLETE LINE OF PHARMACEUTICALS for all branches of veterinary practice may be obtained from the Norwich Pharmacal Company. Learn of the dependable quality of their products by experience. If you write them for literature and further particulars, and mention the REVIEW, you will receive a prompt reply. You will find the address on page 4 of this issue.

IN THESE DAYS OF DIRECT MEDICATION a medicinal agent that can be placed directly into the circulation appeals very strongly to the advanced practitioner; and that is why TALLIANINE has become so popular in veterinary practice. Veterinarians are used to using the jugular vein as a direct route to the system, and those that are familiar with the merits of TALLIANINE use it in that way, and consider it the rational treatment in pneumonia, pulmonary congestion, purpura, influenza, etc. If you write for particulars mentioning the REVIEW, you will receive prompt attention. See address on page 7 (adv. dept.) of this issue.

414¹



JAMES LINDSAY ROBERTSON

AMERICAN VETERINARY REVIEW.

JANUARY, 1914.

EDITORIAL.

JAMES L. ROBERTSON, V.S., M.D., D.V.S.

He that the profession of America had familiarly called *Uncle Jimmy*; he that I called from the heart *my boy*, James L. Robertson, was buried on the 26th of November last, the day after Thanksgiving Day. The day of joy for so many, the day of sadness for the veterinary profession. On Thanksgiving Day the sad news of his death was sent to me, which told of the terrible loss that had befallen American veterinary science, that had deprived me of one of the most devoted friends that one could ever wish for.

The REVIEW has already paid her tribute to the memory of this noble veterinarian, no doubt in proper language; our general sorrow has been told and it is certainly superfluous to say more; yet, perhaps our readers will pardon an old man, one who guided his first steps in our profession, who was happy to look upon him as a worthy professional son, to say a few words of the one with whom he was so intimately related since his entrance in the little place of Lexington avenue, in 1865, the home of the New York College of Veterinary Surgeons, from where he graduated in 1867; and to speak of James L. Robertson as a student, then as a veterinarian and a teacher, and finally as a friend.

To say that James L. Robertson was a thorough, good and perfect student would say but little of him. Every one knows

that to study was his great joy and pleasure. At the time that he matriculated at the Lexington Avenue College there were but few students, the class was so small that often he alone was present at the clinics. But how he then seemed to take advantage of all the small number of clinical cases that were offered for his observation. How anxious he was to benefit by every opportunity. How happy he was when I told him to come and inspect a large herd of cows, which were suspected of tuberculosis, and with what satisfaction he noticed and examined the lesions that he found; many specimens of which he took for the museum of the college, where they must be to-day.

To learn, to investigate, to see and to profit by the opportunities offered were his great desire.

The resources of the institution were limited, and although the teaching was as good as the times and circumstances permitted, when Robertson received his diploma of V. S. he felt that his luggage of medical knowledge was rather slim, and for a man like him and with his tastes it was an obligation to seize every chance to improve. He therefore matriculated in the Medical Department of the University of The City of New York in 1867.

His studies and graduation as a veterinarian were of great advantage in the pursuit of his medical studies, and an M.D. degree rewarded him at the commencement exercises in 1869, and after a short time Doctor Robertson, V.S., joined the staff of House Surgeons in Charity Hospital, Blackwells Island, serving during 1869-70, familiarizing himself and completing his medical education; improving the application of the *general* principles he had gathered during the last few years.

He had been told, he had read, and learned, much of the diseases of both men and animals, he had seen and observed numbers of them as a veterinarian and as a physician; he had no doubt prepared himself well for the practice of medicine in a general sense, but with all these rich provisions, Robertson remained a student.

He knew that if the literature in medicine was rich in his

native language for human practice at least, it is very poor in that of his choice, the veterinary practice; and he must take advantage of what he may get in the literature of foreign countries. French and German he must learn, and he once again resumed his student's life until in a short time he became master of three languages.

His means of perfecting himself complete, he read and benefited in those different languages of the many professional facts that they possessed, and his efforts were well rewarded through his insatiable thirst for more knowledge.

Were those desires finally satisfied? If not, Robertson had selected long ago in what direction the application of all that he knew would carry him.

At first, when he had entered the University as a student, when he received his M.D., and when he was seen as interne in Charity Hospital, those of the veterinary profession who had watched him, who had kept close to him in their professional gatherings, bringing him with them, began to feel anxious, fearing that after all Robertson might give up veterinary practice and follow the practice of human medicine.

A good friend and a superior teacher of his, a veterinarian of ability and a physician, Doctor Large, joined in the efforts made by the Faculty of his Alma Mater, and Doctor Robertson became lecturer on Theory and Practice at the school from which he had obtained his first degree, his V.S.. Lecturer at the New York College of Veterinary Surgeons first, he became professor at the American Veterinary College, at which institution he received his addendum degree of D.V.S., in 1876, where principally began the period of his life as a teacher.

If there was a chance for one to illustrate the Chair of Theory and Practice, and continue and improve the good work started by his predecessor, that chance was offered to Robertson. He took it. He was the man for the position.

Educated with the help of English literature, improved by that of France and Germany, constantly reading veterinary journals from everywhere and from every country, Doctor Robert-

son could not fail but be a superior teacher. He was keeping himself in contact with every thing that was new in veterinary science; from a practical and scientific point of view he was the right man for that place.

His method was simple, and while I do not think he was a pompous speaker nor perhaps a brilliant lecturer, through his manner of describing, his select and properly applied delivery, his facilities in making clear every point where students might be confused and embarrassed, all those qualities can be recognized and remembered by the many graduates who have had him as a teacher, as having placed him in the first rank amongst teachers, and a master of superior ability.

His lectures will be remembered by all who have heard them, and I am sure that if any of his students have kept a good record of them they can boast of having a valuable work in the Practice of Veterinary Medicine.

For years Doctor Robertson has fulfilled his duties as few men have done, rarely missing his lecture hours, prompt at the time, and only when sickness disabled him was he absent. At the end of his active life he was made Honorary Professor of his Chair; and his departure will deprive his successor of a valuable assistant and kind adviser.

His activity in connection with association affairs began early in his professional career. In 1868 he was elected a member of the United States Veterinary Medical Association (now the A. V. M. A.); he served as its secretary from 1869 to 1874, and as its president from 1879 to 1881, and served on nearly if not all committees during his life time.

It remains for me to say a few words of Doctor Robertson as a friend. But how can I? What could I say to show him, not better, but even as good as we have all *known* him.

He was the friend of everyone and, above all, that of every veterinarian.


Veterinarians all over the country who have met him, members of the societies to which he belonged, of the different veterinary colleges that he visited, all of those who have known him

personally can vouch for his good, kind and superior qualities as a man, as a practitioner, as a teacher.

But few perhaps could speak of him in the true sense of the word, *friendship*. And yet how many could probably relate facts relative to that feeling as it existed with our dear departed. Whoever saw his sorrows at the possible failure of one of his intimate candidates for a degree! Whoever saw him with his broken down heart and terrible sadness at the death of his friend, Eugene Burget! Whoever heard him speak of the disgrace of a colleague who chanced to be an intimate friend of his! And how many more! All those would give a measure of what with him the word *friendship* meant. With me, who since the day he entered the school in Lexington Avenue, when I learned to appreciate and to love him as he deserved, up to the moment I returned to Europe, and again in later years, I have found him the most sincere and most truthful friend I ever had. I may have (in very limited measure) contributed to the beginning of his professional life; but my feeble efforts have been largely rewarded by the forty years of his brotherly affection.

The veterinary profession has lost one of its best members—I am missing one who I will ever regret, and whose kind and good souvenir will always remain in my heart.

ALEXANDER LIAUTARD.



EUROPEAN CHRONICLES.

PARIS, 15th November, 1913.

GENERALIZED MYCOSIS IN CATTLE.—In *Hygiene de la Viande et du Lait*, there has been published an observation of unusual interest, revealing the presence of pulmonary, sub-dermic and muscular lesions which bring before the veterinarian the

possibility of a very different form of disease than when tuberculosis was at first suspected. On account of the importance of the subject, I take pleasure in extracting from the article the most important points. The author, Mr. Langrand, who is Chief of the Laboratory of the Sanitary Veterinary Inspection, writes:

“ In veterinary pathology, the diagnosis of sub-dermic lesions of bovines presents great difficulties, as in all cases the questions of tuberculosis or mycosis being present have to be settled.

“ If the previous and most recent works have given to our literature the interesting chapter of the *Tuberculides*, they have also demonstrated that the research of the bacillus of Koch in the sub-dermic lesions is not always followed by success.

“ And as besides, we have but little information on the subject of the external lesions of mycosic origin in *bovines*, the difficulty is great when one is in presence of undescribed aspect and not giving the bacteriological proof of tuberculosis.

“ Such is the case in this relation.”

*

*

*

CLINICAL ASPECT.—“ The subject presents subcutaneous nodules, very hard, not adherent to the dermis, varying in size between that of a pea to that of a large nut, round or oblong in shape, and disseminated over the entire surface of the body, even over the limbs. An indurated lymphatic cord is observed in the carpal region, uniting three of these nodules. The skin over the lesions, is intact and the presence of larvae of vestic cannot be entertained. The subcutaneous lymph glands are normal.

Perfectly distinct from each other, the nodules, which are in great number principally on the neck, are isolated in spaces in the intermaxillary space, the abdomen and the perineum. The animal is thin and coughs. The palpation of the retro-pharyngeal, sub-glossal and parotid lymph glands reveals no adenitis.

Few nodules seemed encapsuled more deeply in the tissues;

on the cadaver some are indeed found in the thickness of the superficial muscles of the chest, of the abdomen and of the thigh.

The lesions found at the *autopsy* were: 1°. In the *lung* isolated or gathered together, purulent centers, varying in size between that of a hazelnut and a man's fist, resembling at first glance the lesions of the tuberculosis of Koch, with this difference that *there was nowhere any trace of calcification*.

Few of these centers open in the bronchia, which contain thick, yellow pus. The recent lesions are the most interesting: By more attentive examination, it is observed that the purulent centers are formed by *several concentric layers* of concreted pus, alternatively of whitish or yellow color, more or less hard from the center outward. There were 5 or 6 layers in succession surrounding the softer center. The most external is fibrous and sends prolongations in the pulmonary tissue around, generally healthy.

The small centres, the subcutaneous and muscular nodules, have all the same structure. The large centres are caseo-fibrous and collected together, forming irregular masses about as big as a man's fist. The same stratification is present.

2. In the *subcutaneous tissue and superficial muscles*. The nodules do not contain pus, if they are large. They give the impression of an elastic tissue, grey in color, and show on section concentric layers alternately light colored or dark, and surrounding a central spot almost as hard as the other parts of the nodules.

There is no trace of calcification and the nodules have a caseo-fibrous type. The lymphatic cord of the carpal region is clearly caseous and of ochre color.

The presence of the concentric layers of the nodules is important as they have not been described in tuberculides, and it suggests the possibility of another affection besides tuberculosis.

The lymph glands of the organism were healthy except the left bronchic and the mediastinal. This last, as big as the fist, is transformed into a large nodule of pus concreted in concentric

layers. The left bronchic gland has in its centre a purulent nodule the size of a pea. No trace of calcification anywhere. All the other viscerae normal.

*

* *

BACTERIOLOGY AND ANATOMO-PATHOLOGY.—Repeated microscopic examinations failed to detect bacilli retaining the Ziehl in the pulmonary tissue, sub-dermic nodules and the mediastinal lymph gland. Alone the left bronchial has, out of ten preparations, given two forms of acido-resisting, reminding one of the bacillus of Koch. From the point of view of tuberculosis, negative result whether with pulmonary or lymph glands lesions.

The histological study of the subcutaneous and muscular lesions show that the nodules are of inflammatory origin and comprehend four distinct zones. And in most of the lesions the coloration with hemateine-eosine revealed the existence in the centre of the nodules of a *vegetal parasite* characterized by threads and spores. This parasite appears under the form of threads intermixed or not, of various sizes, often undulated and terminated by conical spores. This parasite has been found in almost all the degenerated centres and all the pulmonary lesions. In those of the subcutaneous connective tissue the parasite was also found. The case was evidently a true generalized mycosis.

In conclusion, says the writer: "The aspect of the subcutaneous nodules so different from described tuberculides, that of the pulmonary lesions (purulent centres not calcified), the absence of a positive result to the tuberculosis point of view, the presence of a mycelium and of spores in the degenerated tissues, justify the statement that there exist a vegetal parasite other than that the blastomyces and the sporotrix that can invade the various tissues of the organism of bovines—and it appears from that that practically the diagnosis of sub-dermic lesions becomes complicated and as stated at the beginning one may, when suspecting

and looking for tuberculosis, find himself in the presence of a mycosis in process of generalization."

* * *

SURGERY OF FOREIGN BODIES IN OESOPHAGUS.—The presence of foreign bodies arrested in the oesophagus often gives great trouble to the practitioner who is called to relieve the suffering animals. Many are the suggested manipulations, and almost every veterinarian has one which he believes as good if not superior to any other. The *Berliner Tierärztliche Wochenschrift* has related the treatment of two German practitioners.

For Johann, all the classical methods having failed in the cases of oesophageal obstruction by foreign bodies, he recommends the following method:

First it is necessary to make out the position of the foreign body and to be sure that there is no lacerations of the oesophagus, which are often present, as a result of the numerous attempts that are made before the veterinarian is called. If a laceration exists, the animal must be slaughtered. When the foreign body is in the cervical portion of the oesophagus (Johann has never seen it in the thoracic portion), attempts are made to have it returned in the mouth or to push it in the stomach, operations which must be carried out with care. If these failed, as often, then the animal has tympanitis, puncture of the rumen is performed. Then the animal is cast on the right side with head held extended by assistants. Temporary tracheotomy is performed and a Gunther speculum introduced in the mouth, which permits the hand and arm for exploring. To assist the prehension of the body, an assistant pushes it upwards through the skin towards the head.

In case the hand cannot grasp the foreign body, a thin metallic wire, having a loop at its end sufficiently solid to not bend when coming in contact with the mischievous substance. Attempts are made from outside to push the foreign body into the

loop of the wire, while an assistant pulls it out. If the wire is smooth and the crossing of the loop is covered with some cords there is no fear of injury to the oesophagus.

After the operation the speculum is taken out, the trachetomy tube removed and the animal allowed to get up. No accident or complication are to be looked for. Only once out of 17 cases has this method failed.

* * *

Mr. Becker, in the same journal, says that stimulated by the observations of Johann he has resorted to a method which has given him the best results.

First of all he tries to bring the foreign body back in the mouth. The cases that he describes were all of bodies in the cervical portion of the oesophagus. Like Johann, he has never seen them in the thoracic region.

For years he has given up the attempts to push the body towards the stomach, and instead of the oesophageal probang he has used a gum probe, with 3 centimeters diameter.

To push back the body into the mouth, he keeps the animal standing up, the head well extended on the neck. The operator places himself on the left side, passes his right arm over and around the neck and with the thumb of each hand in the corresponding jugular groove tries to displace the foreign body. Apples and potatoes can be easily dislodged on account of their form, but the success is not certain because of the resistance of the animal or of the motions of deglutition which have a tendency to push the body towards the stomach.

To avoid the working of the hands, which is very tiresome, Becker had made a forceps analogous to the nippers of horse shoers, or to those used in the exploration of the foot. Each extremity of these nippers has a ball in shape of a pigeon's egg. This instrument takes the part of the hands, and the balls that of the thumbs.

After several years' application of this method, Becker counts

75 per cent. of success by the use of the nippers. When it is not possible to bring the foreign body back Becker leaves it, and after one, two, three and even four days the foreign body is spontaneously displaced. It is sometimes difficult to convince the owner that the foreign body may be left several days in the oesophagus without causing trouble, and that is often the most difficult part of the operation.

* * *

THE VIRUS OF RABIES.—A few months ago the scientific world was initiated into a discovery made by Dr. Hydeyo Noguchi, of the Rockefeller Institute for Medical Research in New York, and which was related in many of the scientific papers of the Continent. In the *Presse Medicale* of September last, I find the article of Prof. Noguchi and make from it the following extract:

“In the beginning of 1912, I undertook the culture of the virus of rabies, and I have obtained some results which I can sum up briefly.

“There were made fifty series of cultures with the brain and spinal cord, removed aseptically, from rabbits, guinea pigs and dogs which had been inoculated with ‘street virus’ or ‘*virus de passage*’ or ‘fixed virus.’ Generally the animals being etherized a short time before the spontaneous death.

“The method which gave the result that I am about relating, is similar to that which has been employed successfully for the cultures of the spirochetes of recurrent fever. In these cultures, there develop minuscule granular corpuscles and chromatoid pleomorphic corpuscles a little larger; which, after transplantation, reappear in the new cultures during numerous generations. To all appearance these same corpuscles have been obtained with the street virus, that of passage and the fixed. The smallest of these corpuscles are detected at the very limit of microscopic visibility. On four different occasions, I have observed, in the

cultures of the virus of passage and of fixed virus, round or oval nucleated corpuscles surrounded with membranes which notably differed from the smaller granular corpuscles, also developing in the same cultures as those. Their apparition was sudden and abundant, of a duration of four to five days; when they after underwent a diminution which coincided with the increase of the granular corpuscles. In one of the four cases, these larger corpuscles were produced in a culture prepared with a rabbit brain, previously inoculated with culture of virus of passage, resulting with rabid symptoms. In two other cases, the larger nucleated corpuscles were developed in cultures prepared with fixed virus, in which it was difficult to bring in evidence the Negri's corpuscles either on the sections or on froitis.

"The general morphological characters of the nucleated corpuscles were photographed, magnified 1,100 times. With them were also printed as comparison corpuscles of Negri from dogs' brains, which had died with street virus. The cultivated nucleated corpuscles are about multiplying by division or buddings and have the appearance not of bacteria but of protozoars. The individuals gathered in a mass may in a certain time become enclosed in a common capsule. At the ultra microscope, they show defined characters, observed in colored preparations. The centre has a nucleus, the membrane is distinct and very refrigent. About the time where the nucleated corpuscles gradually disappear, numerous granular corpuscles of characteristic formation and minute free round corpuscles appear in the cultures whose signification is not to be considered.

"None of the mentioned forms develop in the other different media tried until now, and the cultures assume an appearance of sterility when they are submitted to the ordinary bacteriological tests.

"In inoculating cultures containing the pleomorphic or nucleated granular corpuscles, rabies has been produced in dogs, rabbits and guinea pigs, as proved by typical symptoms and positive inoculations to animals. In the preparations of froitis made

with the brain of these animals, the granular corpuscles exist always and the nucleated corpuscles are several times present in large quantity."

This discovery of Prof. Noguchi throws a brilliant light on the pathogeny of rabies, which will be admired the world over.

*

*

*

YOHIMBINE IN VETERINARY MEDICINE.—Taken out of human practice, it seems that this new alkaloid has a certain claim for its usefulness in veterinary practice. Indeed, from some of the Continental journals one can find some evidence of the good results obtained by its use. This is a reason for my calling attention to it.

Specific drug of sexual deficiency, this alkaloid was extracted by Dr. Spiegel, of Berlin, in 1895 from the bark of a tree, the Yohimbehe, which belongs to the botanic family of Rubiaceae. It was an African explorer, Ludwig Scholz, that first brought the bark into Europe, and the alkaloid can be found now in trade under the name of Spiegel Yohimbine, where it is offered as nitrate, sulphate, phosphate, lactate or iodhydrate of Yohimbine, but its muriatic salt is the one which is most commonly called for, the others being less stable in their composition.

Like many other alkaloids of vegetable origin, Yohimbine acts on the nervous centers and presents the peculiarity that its elective specific action is strictly localized to the inferior part of the spinal cord and to the centres of erectism that are found there. According to Muller, the centre of erections in dog under the influence of Yohimbine, reacts more promptly to nervous excitations; the touchings of the prepuce, of the internal face of the thigh, etc., promote erections more easily than in ordinary conditions. Yohimbine is then to be considered as the only sexual stimulant, actually known. It has also another property which makes it a true aphrodisiac, it is a vaso-dilator. This action is

most noticed on the genital organs, which in rabbits is principally manifested towards the testicles.

For these many properties Yohimbine has found therapeutic indications which have justified its employment in animals, where the effects have been the subject of important communications and many experiments, scientific and practical, have established the fact that it is a specific against impotency, and that it increases weakened genital power.

Holterbach, a veterinarian from Baden, who was the first to test Yohimbine in animals in 1904, used it in bulls; one especially which had refused to serve cows for nine months, notwithstanding the best food and hygiene; and in 10 days was returned to its duties.

Simon, in *Wochenschrift für Tierheilkunde und Viehzucht*, reports the case of a bull which had become impotent after a bruise of the scrotum and could no longer serve cows; treated with muriate of (Spiegel's) Yohimbine he recovered in five days.

Dr. Enrico Ficarelli obtained similar results in four weeks with a healthy bull which had been unable to serve for two months.

Other similar results were also recorded by Otto Gratz, Gutbrod, Creutz and other who tried it in large male and female animals.

With stallions it has also been employed with surprising results by Creutz of the Cape of Good Hope, by Tetersen, who claimed that after giving Yohimbine (Spigel) for three days he had noticed that the sperm of the stallion, which had been watery, very thin and without spermatozooids previous to the administration of the drug, had a thicker and greyish colored aspect, and showed under the microscope a great quantity of spermatozooids.

A similar case is also recorded by Kogan, a Russian veterinarian.

Reichenbach is the only one who has met with failure.

Yohimbine (Spiegel) for veterinary use is sold as Zosthenic

Tablettes of various doses, which can be given by mouth or in subcutaneous injections.

*
* *
*

TREATMENT OF CAPPED ELBOW.—In the *Berliner Tierarztlich Wochenschrift* there was published lately a few notes on Surgery, by Prof. Magnussen, and among them on the treatment of capped elbow.

In general, this condition is not accompanied with lameness, but its presence changes the appearance of the animal and diminishes its commercial value. It is on that account that the services of a veterinarian are often required.

Maur and Frick recommend, when the capped elbow is not of long standing, to resort to bin-iodine ointment applied every two or three days. If the result is not satisfactory caustics such as arsenic or sublimate may be tried. Injected under different forms in the center of the tumor, they may bring its resorption about. For Magnussen this is a poor treatment. The ligature may be applied on capped elbows which have a fine peduncle, but if the base of insertion is a little too wide, a granulating surface is left which requires a long time to cicatrize.

The best method is undoubtedly the extirpation. Classical processes make the operation difficult, leaving a cavity with wide dimensions after the ablation of the tumour, besides exposing to severe hemorrhages which are difficult to stop and cicatrization by first intention cannot be looked for. Prof. Morkeberg, of Copenhagen, has modified the classical method and it is the one that Prof. Magnussen describes now.

“Chloral being administered by rectum or *per os*, as the anesthesia is about taking place, the horse is cast on the side opposite the one he is to be operated upon and the leg is left in the hobble. A rope, fixed round the coronet, is pulled forward to disengage the field of operation. The region is shaved and disinfected. In the direction of the length of the tumour double silk

threads are passed, 3 or 4 centimeters apart, from upwards downwards generally, as far as the base of the tumour. Parallel to the great diameter of the growth a rubber tube is applied and secured as in the Bayer's suture. The skin is incised round the tumour in such a way as to permit an easy coaptation of the edges of the wound. The tumour can then be removed without fear of hemorrhage. If an arteriole is divided, forcipressure forceps closes it. During the extirpation of the tumor, some threads of the Bayer's suture may be cut, they can be replaced after the operation. To be sure that there remains no fibrous tissue, interrupted suture is made. Prof. Morkeberg places a drain, Magnussen does not. The region is covered with iodoformed gauze and the animal allowed to rise. He is placed in slings until complete recovery. Care must be taken that the animal does not tear the dressing with his teeth or rub it off with the hind legs. The deep suture may be removed after 10 or 12 days, cicaterization is said to be completed in fifteen days, leaving only a hairless linear cicatrix and a few spots without hairs, which are easily concealed by those of the surrounding parts." How pretty all these look on paper!

*

*

*

GEEL-DIKKOP.—Under this name Mr. Dixon, veterinarian, has described a disease of small ruminants which is reprinted in the *South African Agricultural Journal*.

It takes its name from the swelling of the head and yellow serous effusion underneath the skin of the head and is a disease affecting sheep and goats, being prevalent principally during the summer months.

Sheep and especially lambs are more susceptible to it than goats and merinos more than Cape sheep. The disease is attributed to several causes, by some to the eating of small creeping plant called the "dubbeltje-doorn," by others to a small grub which is embedded in the stalk of the dubbeltje-doorn, by others

to the water drunk under certain conditions, during the heat of the day.

The symptoms are described as follows: The first noticed is a hanging of the ear or a shaking of the head, and if the animal is caught the ears will be found hot and swollen. The swelling will extend to the face and between the lower jaws. The temperature is not usually very high for sheep, ranging between 103 degrees and 105 degrees Fahrenheit.

The serous effusion beneath the skin of the head is at first clear, afterwards becoming of a yellow golden color as soon as symptoms of jaundice show themselves, and are apparent first in the eye. Within a few days the animal becomes weak and depressed, lying down for a long time.

The feces are hard and coated with yellowish mucus and sometimes tinged with blood. The skin over the tumefied portions of the head (eyes, lips and eye lids) becomes hard and dry, cracks and peels off, leaving ugly sores. The average duration of the disease is about four to seven days. Sometimes however cases will last longer. In those cases the affected animals will become emaciated and die with bilious poisoning.

Post Mortem Appearance.—Jaundiced condition of the whole body and yellow serous effusion in the connective tissue of the skin of the head and ears.

The liver is congested, sometimes of a deep yellow color with the bile ducts filled and the gall bladder is distended with bile, which is generally thick and acid.

The kidneys are enlarged, but do not appear to show any structural alteration, nor does the spleen.

In the digestive track is observed a catarrhal gastritis of the abomasum and inflammatory redness with hemorrhage in the small intestines and catarrhal lesions of the entire intestinal canal.

The urine contains bile, and the jaundiced condition of the body is due to the catarrhal lesions of the bile ducts obstructed.

The treatment recommended seems very simple—while it is possible to treat with success affected animals early in the disease

when the majority of cases will recover with a dose of calomel, 5 to 10 grains, according to size and age, oftener when the disease is far advanced the treatment is of little avail and calomel better be left aside. Early treatment is the principal indication. However, in cases where the swelling of the head does not seem to subside, chloride of ammonia 40 to 60 grains daily are indicated.

It is also very essential to separate the sick from the flock at once, placing them in covered sheds to protect them from the sun and allow them to remain quiet.

* * *

BIBLIOGRAPHIC ACKNOWLEDGMENTS.—*U. S. Department of Agriculture*. Bureau of Animal Industry—Bulletin 167, *Action of Arsenical Dips* in protecting cattle from infestation with ticks, by H. W. Graybill, D.V.M. Bulletin 160.—*The care of the farm egg*, by H. N. Lamon and Charles L. Opperman of the Animal Husbandry Division.

Chicago Veterinary College Bulletin.—September, 1913.

Veterinary Notes.—Park, Davis & Co., September, 1913.

Agricultural Journal of South Africa.—August and September.

Zeitschrift für wissenschaftliche und Praktische Veterinar-medicin.—(Journal of Veterinary Medicine of the Institute of Doopal.)

A. L.

NOW IS THE TIME.

Opportunity is the handmaiden of success in the securing of legislation. Military legislation is easiest obtained in the United States at a time when war is seen to be, if not immediately, at any rate remotely, possible, as a result of international complications between our own country and another. Such a dangerous situation exists in Mexico to-day, and it is sure to have its effect this winter in bringing to the foreground in Congress the necessity for military preparedness. War Department legis-

lation is going to be easier in this session of Congress, apparently, than in any since the Spanish War. The other day a bill, now before the Senate, passed the House, authorizing the President, in case of public necessity, to raise a volunteer army; for it is known from our experience in the last Mexican war that 65,000 men will be needed to capture Mexico City and that 100,000 more men will be wanted to disarm guerilla bands, entirely pacify the country and restore order and the reign of law. Though economy is the political cry of the hour, the new army appropriation bill for the fiscal year 1914-1915, now before Congress, carries new items, amongst them a special appropriation for field artillery munitions, which will bring it up to \$106,000,000, a decided increase over the last three years and an increase of fully \$11,000,000 over the appropriation for the fiscal year 1913-1914. We are not going to intervene in Mexico except in extremity; but we are going to make every preparation for intervention should that extremity arise. Consequently there will be less balking at military legislation in the 63d Congress than in the 62d Congress, and all military measures will feel the lilt of the vexatious war situation and will move easier in their course.

Now is the time, therefore, for us to push our measure, the army veterinary service bill, H. R. 4541. The Mexican situation will help our bill through Congress along with other military bills suitable for present and future army improvement. It was during the Spanish war contingency that Dr. Huidekoper very nearly won his struggle for the formation of an army veterinary corps. It is now, in face of the Mexican difficulties, that Dr. Hoskins will find doors opening before him. We should take occasion by the hand. Events are propitious for the army veterinary service bill. The opportunity should be seized while it is nigh.

The War Department is looking much more favorably upon our claims, that the army veterinarian should be a commissioned officer, as provided for in our bill. In the Committee on Military Affairs of the House, Mr. Hay, the Chairman, will take care of the interests of the bill because it is his own bill, as he introduced it personally. On the floor of the House the bill will be defended

by such men as Congressman A. Mitchell Palmer, of Pennsylvania, who was President Wilson's floor leader in the Baltimore Democratic Convention, and whose own brother is a graduate veterinarian practising at Easton in the Keystone State. We should have very little difficulty in getting the bill through the House.

In the Senate there is a mountain of work before us to pass the bill. Means will have to be found to reach every Senator; but by searching for influences and concentrating them upon each Senator we ought to be able to press a passage. Some one man or some few men in each State will have to be found who will make it their business to round up influences and win over the Senators. They are fewer in number, but on the whole not so easy to reach as Representatives. There is however always a way to reach the throne; there is always a way to reach the top men as well as those in lower estate. The thing to do is to find the way. In view of the ugly situation of affairs in Mexico, Senators will be more considerate of all military legislation and more approachable by us. Since our struggle is to be in the Senate, every loyal veterinarian should hold himself in readiness to lend a hand. The Senators are made to take an interest in most miscellaneous ways. It is your duty to reach your Senator yourself or have some one reach him for you in the interest of the bill.

G. S.

A TRIBUTE TO THE MEMORY OF JAMES L. ROBERTSON FROM A FORMER STUDENT.

James L. Robertson—student, scholar, practitioner, teacher, association worker and supporter, and sincere friend.

Full of years, more than two score of which he filled the rôle of teacher, counselor and instructor, he has passed from our midst and into the great beyond—full of honors, the personal regards of all who knew him and loved by all who basked in his personal friendship.

A pioneer in the field of teaching veterinary medicine as a science; by example as an ideal and ethical practitioner he gave to veterinary medicine riches of incalculable worth in leading others to a more ethical regard for our calling. As a counselor he was of few words, but they were words of wisdom, the fruits of an observing experience and in the highest sense a full appreciation of the true relations of practitioner and client.

Of the kindest of nature he won the loving regard and utmost respect of every student whose privilege it was to listen to the words of wisdom that fell from his lips. A profound student himself and a great reader and delver into the products of the world's best students and writers, he carefully weighed every fact he presented and the value of every such claim was weighed and tested in a wide and varied experience as a practitioner and the truths only presented as they were milled in his own strong mind and keen observation.

As an association worker and supporter he filled every rôle of service in our national body—secretary, treasurer, president, committee worker and contributor of his own observation and study, and liberal supporter of every movement that tended to its growth and advancement. By his unvarying attendance at its meetings, his constancy in attending its sessions, and his participation in its deliberations, his life work in this field was beautiful and complete. Even when impaired health and sapped energies were undermining his physical forces, he made the journey to California as a testimonial of his devotion to association service.

To have known intimately so many sides of this good man's life was one of the precious privileges that I have enjoyed and to his memory let me add my testimonial of loving admiration for the splendid traits of character that marked his life as a friend, teacher, counselor, practitioner and association worker.

His work is finished, he filled well every duty, and his memory will linger longest with those who knew him best.

W. HORACE HOSKINS.

WILLIAM HUNTING, F.R.C.V.S.

In the *Veterinary News* (London) of November 1st, we read of the death, on October 24, 1913, of William Hunting, Past President of the Royal College of Veterinary Surgeons, Consulting Veterinary Inspector to the London County Council and Editor and Proprietor of the *Veterinary Record*. Professor Hunting was in his 67th year. He was the eldest son of the late Charles Hunting, M.R.C.V.S., of South Hetton, Durham. Graduated from the Royal College of Veterinary Surgeons in 1865, he became Professor of Veterinary Science at the Royal Agricultural College, Cirencester, and subsequently at the Albert Veterinary College, established by Prof. Gangee in London. For a number of years he enjoyed a large and lucrative private practice in London; but Prof. Hunting's ambitions were directed more toward the advancement of his profession than the amassing of a fortune. There has been scarcely any position of trust or honor in the gift of the profession, to which he had not added lustre and dignity at one time or another. Space will not permit of the enumeration of the many societies in which he has held office; or of the many contributions that have been his toward the upbuild of veterinary science; and not alone England, but the world sustains a heavy loss through his demise.

RICHARD GLOVER, F.R.C.V.S.—This well-known English veterinarian died recently of Bright's disease, in his 69th year. Mr. Glover carried on a successful practice at West Ham, where he was also inspector of contagious diseases of animals, by appointment of the Town Council, and lecturer and examiner of the Royal Sanitary Society in connection with inspection of meat at the chief markets in London. He was an active Mason and a member of the Ancient Order of Foresters.

SOUTHERN CATTLEMEN'S ASSOCIATION.—The 1914 meeting of the above association will be held in Meridian, Mississippi.

ORIGINAL ARTICLES.

THE DIAGNOSIS OF GLANDERS.*

BY JOHN R. MOHLER AND ADOLPH EICHHORN, WASHINGTON, D. C.

It is no longer doubted that in the work of controlling glanders the destruction of the infected animals should be given prompt consideration, and if possible the infection should be traced to its origin. Unfortunately, the nature of the disease is such that only a comparatively small proportion of the cases can be recognized by the ordinary clinical examination, and as long as we limit our efforts to the destruction of these cases, the disease will continue to spread. An effective control can be accomplished only by the elimination of all centres of infection of glanders. Therefore it is essential primarily to have means of diagnosing accurately all forms of the disease.

Numerous publications have been issued on the various methods of diagnosis and it seems that while some favor a certain method or methods, others appear to produce sufficient evidence to point out the inadequacy of these methods. There is no question but that in the last decade important progress has been made in the diagnosis of this disease. In fact, since the discovery of mallein competent investigators have fruitfully studied this phase of the question of the control of glanders, and at the present time we possess several methods by which we are reasonably sure of diagnosing practically all cases of glanders. A minimum percentage of failures will probably always have to be contended with, as a good many factors enter into the execution of any test.

In judging a method which would be the most satisfactory

* Presented at the 17th annual meeting of the U. S. Live Stock Sanitary Association, Chicago, December, 1913.

for the diagnosis of glanders various things have to be taken into consideration, but especially the reliability of the test. It should be convenient, the results should be manifested as early as possible, the reaction should be distinct and well-marked, and probably the most important of all it should be possible for the practicing veterinarian to apply the test. The last condition must be seriously considered since the standing of the veterinarian in the community and the confidence of the public in his work would be more manifest if in suspected cases he could personally decide on the diagnosis instead of having to depend entirely on the results of serum tests made at some distant laboratory.

It would require a great amount of space to enter into the history of the various methods of diagnosis and to enumerate the data we possess on the different tests. The advantages and disadvantages of the various methods, especially of the subcutaneous mallein tests, have been repeatedly published and are accessible to all those who are interested in the subject. There is no question but that the subcutaneous mallein test is one of the valuable diagnostic agents for glanders, but no one can any longer deny that failures from this test are more numerous than are desirable. As a matter of fact, the uncertainty of the results from this test caused numerous investigators to seek some other methods which might replace the subcutaneous mallein test. Besides the failures resulting in this test, the technique of execution of the test together with the time required for the conclusion of the test makes it unpopular for many veterinarians and sanitary officers.

Of the other tests which have been devised for the diagnosis of glanders from time to time the precipitation, the opsonic, and the conglutination tests will not be considered since the results from these tests are not encouraging.

For laboratory tests the combined agglutination and complement fixation test will no doubt remain the most satisfactory and can always be safely applied in cases where doubt arises as to the results of other tests carried out by the practising veterinarian. Thus these tests should be considered as accessory tests and provision should be made everywhere so that in case of doubt

the serum could be subjected to these tests, and the final decision should rest on their outcome.

During the past few years the ophthalmic mallein test has gained great favor in the diagnosis of glanders. The popularity of the test is rapidly gaining wherever this method has been applied, and among its supporters we find at the present time the greatest authorities on the subject of glanders and on clinical diagnosis. This method of testing is at present officially recognized in Austria, and the indications are that ere long it will constitute the official test in other countries. The results obtained in Austria, where the test has been employed for several years, are very gratifying, and Schnurer, one of our greatest authorities on glanders, claims that the control of the disease can be very satisfactorily carried out by the application of the eye test, supplemented in doubtful cases by the agglutination test. Bavaria has recently adopted this method of diagnosis for official testing. In Germany this method of diagnosis is also gaining in favor and current veterinary literature contains expressions of satisfaction of this test from many German authorities. The Bureau of Animal Industry, in consideration of the favorable results obtained from this test, has decided to recognize this method of diagnosis for interstate shipments of equines, and the forthcoming issue of Service Announcements will contain this information. Horses offered for shipment to Canada must continue to be tested by the subcutaneous method, as the ophthalmic test has not yet been officially recognized by the Canadian authorities.

This method has a great advantage over others by its very simple application. It may be readily executed by any veterinarian, and its other advantages are that the results are obtained in a comparatively short time and are as a rule distinct and definite. The simplicity of its application is plainly manifest when compared to the subcutaneous test as it is only necessary to drop into one of the eyes of the animal to be tested 3 to 5 drops of concentrated mallein, or by a still simpler procedure to dip a camel's hair brush into mallein and introduce this into the conjunctival sac of the animal. The reaction usually commences in 5 to 6 hours after the introduction of the mallein and lasts from

24 to 36 hours. A positive reaction is manifested by a purulent secretion from the tested eye. This may be very profuse or slight, sometimes associated with a severe conjunctivitis and

The discharge from eye and swelling of lids are the features in these photos.



1.—Strong purulent discharge with swelling and gluing together of both lids.
P + + + +

edema of the lids, and at other times without any inflammatory symptoms being present. At times only a very small quantity of pus may be present in the inner canthus of the eye. At other times the reaction may manifest a true pyorrhea.

The reaction manifests itself in varying degrees in the animals, but the intensity of the reaction has no relation to the extent of the disease in the reactor.

The available data on the ophthalmic mallein test is sufficient to draw conclusions as to the reliability of the method, and in Austria alone it has been applied on many thousands of cases with uniformly good results.

In considering the good results obtained and the advantages of this method of testing a concentrated mallein has been prepared for this purpose by the Bureau of Animal Industry, and this was made available to a number of practicing veterinarians who desired to give this method of testing a thorough trial. It has been also employed by inspectors of the Bureau of Animal Industry in their field work, and reports are accessible regarding its action for diagnostic purposes on more than 8,000 cases. The results from all sources were uniformly satisfactory. Practicing



11.—Strong purulent discharge with swelling of both lids. P + + + +

veterinarians who have given this method a trial have reported very favorably on the tests made and those conducted by the Bureau Inspectors on several thousand animals were also satis-

factory. At all opportunities this method has been applied in Washington, and recently in some immunizing tests of glanders conducted by the Bureau of Animal Industry there was a good opportunity to repeatedly employ this test. In all these instances the results were uniformly good. In cases of glanders there appeared a marked purulent conjunctivitis and the reaction at times was so severe that the animal could not open its tested eye.

The essential factor in obtaining satisfactory results from the tests appears to be in the use of the right kind of mallein. It must be by all means a concentrated mallein and apparently the best results follow the use of raw mallein, which as a rule represents the mallein obtained after the concentration of the filtrate from the bouillon cultures of the glanders bacilli. The ordinary mallein used for subcutaneous testing is not adaptable, and the few failures which have been reported in the literature were without doubt in the majority of cases due to the fact that the mallein employed was not sufficiently concentrated. Marioth correctly asserts that the reaction does not depend as much on the quality and quantity of the mallein as on its concentration. Our experiments in preserving such mallein with the ordinary quantity of 0.5 per cent. carbolic acid showed that it does not interfere with the results of the test, although the lacrimation which follows immediately after the introduction of the mallein is more profuse than when carbolic acid has not been added, but this disappears within 1 or 2 hours after the application of the test. The concentrated mallein which has been prepared by the Bureau for this work and which gave such satisfactory results was carbolized, but contained no glycerin as a preservative. Only the glycerin which is added to the culture media is contained in this ophthalmic mallein. The precipitation which takes place in the concentrated mallein is eliminated by repeated filtration and the product even after several months of keeping showed no indication of a precipitate or cloudiness. It represents a brownish heavy fluid.

It is advisable to provide the mallein for the tests in small vials, each containing about 1.5 c.c. of mallein, which is sufficient for testing 15 horses. After the vial has been opened and

part of the contents used for testing, especially if the mallein has been taken out with a camel's hair brush, it should not be used for tests applied on subsequent days, but should be discarded.

Another form of mallein which has been used quite extensively for the eye test is the mallein siccum or dry mallein. This represents an alcoholic precipitate of mallein. It is a fine grey powder and must be dissolved in water before it is used. The solution loses its effectiveness in a very short time and must be prepared fresh on the day of the test. Dr. K. F. Meyer, formerly of the University of Pennsylvania, and now of the University of California, used the dry mallein extensively, and at the present time this preparation is employed in Pennsylvania for the application of the ophthalmic test. For this purpose 2 vials are sent out from the laboratories of the Pennsylvania Livestock Sanitary Board, one containing the powdered mallein, and the other sterile or saline water in quantities which will make a 5 per cent. solution of mallein. The contents of the bottle containing the solution is poured into the bottle containing the mallein, and the test fluid is thus prepared. The results with this form of testing in Pennsylvania appear to be highly satisfactory, as may be seen from a publication by Dr. Meyer on the Conjunctival Reaction for Glanders in the March, 1913, number of the *Journal of Infectious Diseases*.

The advantages of the use of one or the other of these forms of mallein for the eye test are not marked, as equally good results were obtained from the application of both forms of this product. The fact that the preparation of the raw mallein is less laborious and expensive than the mallein siccum and that it is ready for use on opening the vial would probably give this product a greater popularity. It is only natural that should subsequent extensive testings show the superiority of the dry mallein it will be given preference over the raw product.

The favorable results which have been attained with this diagnostic method can no longer be denied. Its practicability is apparent and its use in the control of glanders appears to be advisable.

Glandered animals are hypersensitive to mallein in a way that

the administration of small quantities of mallein produce local inflammatory processes. In larger quantities it produces a febrile general affection. The hypersensitiveness appears as a rule during the third week after the infection and reaches its height in the first few months after the infection. In the subsequent course it subsides in retrogressive cases even to the unsensitiveness of healthy animals, but even in these cases various conditions may bring on an increased sensibility.

Before the application of the test the animals should be carefully examined to ascertain whether the eye shows conjunctivitis or other changes which are associated with suppuration. Should such be present the test should not be applied.

The test consists in introducing into the conjunctival sac of the eye several drops of either undiluted raw mallein or a solution of precipitated mallein (0.1 to 0.2 c.c. per horse). This may be introduced either with the aid of a camel's hair brush or with an eye-dropper. The other eye is not treated but serves as a control for comparison of the reaction. For the testing of horses in the same stable the same dropper or camel's hair brush may be used for all animals.

As soon as the mallein is introduced into the eye practically all animals show a lachrimation, increased reddening of the conjunctiva and slight photophobia. No significance should be given to these symptoms. They disappear in one to two hours.

The characteristic manifestations of the reaction for glanders commences as a rule from 5 to 6 hours and lasts 24 to 36 hours, sometimes longer. It consists of a purulent discharge from the conjunctival sac which is typical, as well as swelling and gluing of the eyelids. It is advisable to examine the tested animals from 12 to 24 hours after the application of the test in a good light.

A suppurative discharge of varying quantities is considered a positive reaction. The conjunctiva and the eyeball should also be included in the examination after examining the discharge. A pseudo-reaction can be produced by artificial or accidental irritation of the eye. By removing the purulent discharge (either by the stable attendant or by the animals licking each other, etc.),

the positive result may be obliterated. In such cases dried pus may be frequently found on the parts around the eye.

Generally the positive ophthalmic reactions are not accompanied by fever or systemic disturbances. Occasionally, however, affected horses are hypersensitive to such a degree that even the few drops of mallein placed in the eye may enter the circulation and produce fever. Therefore it is advisable to accompany the ophthalmic reaction with temperature readings. For this purpose the temperature should be taken twice, the first time when the eye test is being made, and the second time when it is judged. In a doubtful eye reaction where there is an increased temperature of $1\frac{1}{2}$ degrees Fahrenheit, the test should be considered positive if the animal had a normal temperature at the time the test was made.

In the absence of any secretion the test should be considered negative. When there is a mucous secretion or lachrimation during the period of reaction the test must be considered as atypical, and in such cases it may be repeated the same day when as a rule the results are more confirming.

The application of the ophthalmic test should not be repeated very often on the same animal, as experiments show that the reaction after the third application usually loses its intensity in positive cases and on subsequent tests may be entirely absent. In cases where the results of the second test immediately following the first test are atypical, the blood of such animals may be drawn and forwarded to a laboratory for the serum diagnosis. From experience gained with the eye test such a procedure would become necessary only in a comparatively few cases.

The Special Committee on the Control of Glanders of the American Veterinary Medical Association gave a most excellent report on the various phases of diagnosis of glanders, and the conclusions on the value of the eye test offered by the committee are in perfect accord with our findings, and therefore we deem it advisable to include them in this paper as follows:

1. The ophthalmic test not only meets all the requirements, but is without doubt the most convenient diagnostic method at our command.

2. Its reliability compares favorably with any of the other tests available.

3. The reaction is usually very distinct, and doubtful or typical reactions are rather infrequent.

4. The ophthalmic test has the advantage that it does not interfere with subsequent serum or other mallein tests if such are deemed necessary.

5. The test may be repeated within 24 hours on same or control eye. If another retest is necessary, it should not be made in less than three weeks.

6. The ophthalmic test should be recognized by State and Federal authorities, since its reliability can no longer be doubted.

7. In all atypical and doubtful cases of the ophthalmic test the combined complement-fixation and agglutination or subcutaneous mallein test should be utilized for confirmation. Such a procedure would minimize the failure and would assure the best results in the control of the disease in a single stable or in an entire community.

APPENDIX.

The results achieved in Austria with the ophthalmic test have been remarkably successful, and deserve the most earnest consideration. The report of Prof. Schnürer on "The Results of the Diagnostic Procedure in Glanders in Austria," is a convincing proof as to the value of the eye test in the control of glanders. The senior writer received a communication only a few days ago from Prof. Schnürer, and since it deals principally with the diagnostic value of the eye test a quotation from the letter will no doubt be permissible.

"I am at the present contemplating collecting the results of the eradication of glanders in Austria during the last three years (1910-1912). During this time 60,894 tests were undertaken on 47,973 horses. Of 272 cases which were found on post mortem to be affected with glanders, 240 (88.2 per cent.) were positive, 21 (7.7 per cent.) gave an atypical reaction, while 11 (4 per cent.) were negative. Of the 47,701 healthy horses, 189 (0.39 per cent.) were positive or atypical, the remaining 47,512 (99.61 per cent.) gave a negative reaction.

"According to these results, therefore, the eradication of glanders is only a question of organization, that is, the malleinization of horses at the border and conscientious following up of all suspected horses. Such procedure would without doubt result in a complete eradication of glanders. At the Veterinary School of Austria we have now difficulty in showing the student cases of glanders, and for demonstration purposes we are compelled to artificially infect horses, whereas several years ago we had every week at least one case of glanders in our clinics.

"I use as mallein at the present time a product which I myself prepare which represents a bouillon filtrate from seven different strains of glanders bacilli which has been concentrated to 1/10 of the original volume."

The optimistic view of Prof. Schnürer is certainly justified from the results he achieved and clearly shows that with proper organization in the control work of glanders the eradication of the disease is only a question of time.

The eradication of outbreaks of glanders cannot of course be altogether attributed to the eye test, since from the report of Nevermann, Veterinary Councilor of Prussia, glanders has diminished remarkably in that country, although they employ the combined complement-fixation and agglutination test for the diagnosis, while McGilvray has practically eradicated glanders from the Province of Manitoba by means of the subcutaneous mallein test. The method of testing by means of complement-fixation and agglutination is undoubtedly the most accurate of any available, but since it cannot be as conveniently applied as the eye test, its disadvantages are apparent. There is no doubt that with the application of either the eye test or the combined complement-fixation and agglutination tests, good results may be obtained, provided that the work is conscientiously carried out and that all the reactors are destroyed without hesitation.

As long as the authorities will limit themselves to the destruction of clinical cases only and will not take immediate action on reactors of the occult and latent character, glanders will not only continue to exist, but it will spread.

AN ANALYSIS OF DR. McLAUGHLIN'S PAPER ON "THE TISSUE MEDIUM".*

BY THOMAS B. KENNY, M.B., CH.M., M.D., NEW YORK CITY.

I appreciate the kind invitation extended to me by Dr. Ellis to take part in the discussion on Dr. McLaughlin's interesting paper on "The Tissue Medium." I feel rather diffident in offering criticisms because these are not always welcome and sometimes may give umbrage, but Dr. Ellis has assured me that Dr. McLaughlin is seeking light and welcomes criticism of his theory. This is the true mental balance which every real investigator assumes, because it is the criticism launched at each of us which spurs us on to better work and greater triumphs. All of us are seeking light, and it speaks well for an investigator when he invites criticism.

The initial difficulty which presents itself on reading Dr. McLaughlin's paper is the term "tissue medium," and we are not quite certain as to what it expresses. We all know that every cell in the body is bathed in a fluid or pabulum, which is lymph. We would like to be certain that the term "tissue medium" is synonymous with lymph, because we cannot over-estimate the importance of this fluid as it has to do with the life and functions of the cell, involves questions of absorption, conversion of food into energy, the supply of nutriment to the cell, and it is the medium which enables the cell to get rid of the waste products which result from metabolism. The lymph, therefore, bears an important relation to the welfare of the organism and therefore to health and disease. The physician is brought face to face daily

* Presented to the December meeting of the Veterinary Medical Association of New York City.

NOTE—Dr. McLaughlin's paper referred to, appears in the December, 1913, issue of the REVIEW, beginning on page 319.

with biological, chemical and physiological problems in dealing with the relation of the cell to the intercellular fluid and the treatment of disease. If the lymph be impaired the function of the cell will be impaired, and if prolonged will lead to pathological change. The lymph also bears a very important relation to specialized tissues as found in glands such as the salivary glands, the testes, the thyroid and the various ductless glands so necessary for the welfare and protection of the body, because the lymph spaces are the chief reservoirs for fluid from which the cells during the act of secretion derive the fluid necessary for the process. One realizes still more the importance of the lymph if he remember that with the exception of the splenic corpuscles and a few perivascular lymph spaces of the central nervous system the cells of the body are not in direct contact with the blood. Such structures as the cornea, cartilage, skin, bone and ligaments, and such organs as the heart, liver, kidney, obtain their food supply necessary to life from this intracellular fluid or lymph. If this be the substance referred to by Dr. McLaughlin as "the tissue medium" you will realize the importance of the questions he propounds.

The author, we note as we read, criticises the arrangement of the liver and the pancreas, and tells us that: "Here mechanical principles, if not cast aside entirely, are not treated with due attention, especially as regards conservation of space, for these organs, instead of being in close touch with the intestines as are the salivary glands with the buccal cavity, and the gastric cells with the stomach, are situated in the abdominal cavity."

It really is difficult to follow Dr. McLaughlin. Surely he cannot mean that the stomach and pancreas should be somewhere else instead of the abdominal cavity, to be in close relation to the intestines. Could they be placed in any other cavity of the body and be in closer relation to the intestines than in the abdominal cavity? If we examine the liver in its form and relations to adjacent parts we must admire the perfect workmanship which has constructed so marvelous an organ for the tremendous activities carried on in so small a compass. The arrangement of its lobes

is to conserve space. Anatomically we see how perfectly the convex upper surface fits into the concavity of the diaphragm and the base of the right lung. Can any better attempt at conservation of space be presented than the manner in which those important vessels, the portal vein, the hepatic artery, the bile ducts, etc., are housed between the lobus spigelii and the lobus quadratus? Can the liver be in closer touch with the intestines than it is? We find on examination that the length of the hepatic duct is but $1\frac{1}{2}$ to 2 inches, the cystic duct but $1\frac{1}{2}$, and the common bile duct but 3 inches long. Compared with the ducts of the salivary glands which Dr. McLaughlin claims to be in closer relation to the buccal cavity than the liver and pancreas are to the intestines, we find that Stenson's duct from the parotid is $2\frac{1}{2}$ inches long, Wharton's duct from the submaxillary 2 inches long and the sublingual ducts are many and varied in length. A glance at the pancreas as it lies in the abdominal cavity illustrates even more perfectly that wonderful conservation of space which we find in every part of the organism, animal and human. The head of the organ is snugly fitted into the curve of the duodenum to save space and the body and tail extend towards the left from the curve of the duodenum to the spleen, lying partly over the left kidney. It is flattened out so that it might fit snugly behind the transverse colon, a portion of the head being insinuated behind a part of the duodenum, and in front of the aorta, the inferior vena cava and the renal vessels. Surely no greater conservation of space and the utilization of every little bend and hollow could be devised. So close is the relation between the pancreas and the intestines that the pancreatic duct passes directly through the wall of the duodenum, and to further show the spirit of conservation this duct and the common bile duct enter the duodenum by a common opening as a rule. The mighty cosmic intelligence could not show greater regard than it has done in evolving through the ages organs more perfectly fitted for the purpose or a greater respect for conservations of space than we find in the relations which exist between the liver pancreas and the intestines?

The next objection Dr. McLaughlin raises is that there is

but one secretion in the buccal cavity, one in the stomach, but there are three in the intestines, and he asks why this difference and tells us that physiology gives no satisfactory answer, and furthermore we are as yet "not a unit in the functions of the bile and pancreatic fluid." We cannot agree with Dr. McLaughlin because physiology gives us a very satisfactory reply, just as it does in reference to the functions of the salivary secretions and the gastric secretions. What do the three secretions referred to by Dr. McLaughlin consist of? Physiology teaches us that they consist of definite known substances. We have:

(a) The pancreatic juice, consisting of four enzymes or hydrolytic ferments. These are (1) *amyllopsin*, which has a more powerful diastatic action than the ptyalin of the saliva because it acts on raw as well as boiled starch, converting it into maltose. It further alters glycogen into dextrin and grape sugar, and even cellulose is said to be dissolved and gum changed into sugar by it. In the intestines nearly all the starch is converted into maltose, and very little dextrin is left at the end of a prolonged digestion. (2) *Trypsin*, the tryptic or proteolytic ferment which acts upon proteids at the temperature of the body when the reaction is alkaline, and changes them into a globulin like substance then into peptone or albumin, and lastly into true peptone. (3) *Steapsin*, a fat-splitting ferment which causes neutral fats to take up a molecule of water and split into glycerine and their corresponding fatty acids. The liberated fatty acids are partly saponified by the alkali of the pancreatic juice as well as the intestinal juices, and it so acts upon fats as to produce a fine permanent emulsion. Both the soaps and emulsion can be absorbed. (4) The pancreatic juice contains a mild curdling ferment.

(b) *The Bile*.—What are the functions of the bile? (1) It plays a part in the absorption of fats by emulsionizing neutral facts so that the fatty granules pass more readily through or between the cylindrical epithelium of the small intestines into the lacteals. Fat flows more easily through capillary tubes moistened with bile, and filtrates under less pressure through a membrane

likewise moistened with bile. (2) It contains a diastatic ferment which transforms starch into sugar and glycogen into sugar. The action is feeble. (3) It excites contractions of the muscular coats of the intestines and contributes thereby to absorption. (4) It moistens the wall of the intestines and gives to the faeces the normal amount of water, so that they may be readily evacuated. Bile is a natural purgative. (5) The bile diminishes putrefactive decomposition of the intestinal content, especially with a fatty diet. (6) The presence of bile seems necessary to the vital activity of the intestinal epithelium in its supposed function of being concerned in the absorption of fatty particles.

(c) The succus entericus or intestinal digestive fluid is secreted by the numerous glands of the intestinal mucous membrane, Brunner's and Lieberkuhn's glands. Brunner's glands in the duodenum secrete a fluid consisting of mucin and a ferment. This ferment causes a solution of proteids and has a diastatic action which converts maltose into glucose. Lieberkuhn's glands from the duodenum downwards are the chief source of the intestinal juice. This juice possesses a less diastatic action than the saliva and the pancreatic juice in the small intestines, but not in the large; it does not, however, form maltose, but converts maltose into grape sugar, and one of its functions is to continue the action of the saliva and pancreatic juice which usually only forms maltose. It peptonizes fibrin, less easily albumin and partly emulsionizes fat, and it converts cane sugar into invert sugar.

These facts from the physiology of the three intestinal secretions surely prove that they meet fully and in every way the biological, chemical and physiological requirements following the intake of food into the intestinal tract. We can but admire the admirable manner in which nature has supplied a suitable substance to deal with every variety and kind of food substance which passes into the intestinal tract, and we assert emphatically that physiology gives a most satisfactory answer why there are three secretions in the intestines.

Upon what grounds does Dr. McLaughlin base his conten-

tions that the lymphatics continue the processes begun in the alimentary apparatus as the chyme passes into those vessels? He tells us that it is the lymphatics which change chyme into chyle, and leads us to believe that he endows the lymphatics entirely, with the powers and the process of absorption. Is it not rather the special cells of the intestinal villi which convert chyme into chyle as it passes to the lacteals? All the constituents of the food, with the exception of the fat which is changed into fine emulsion, are brought into a state of solution by the digestive processes and passes through the walls of the intestinal tract either into the blood vessels of the mucous membrane or into the beginning of the lymphatics (the lacteals) by endosmosis, diffusion and filtration. Water and soluble salts are easily absorbed and pass readily into the blood as well as into the lymph vessels. Water passes chiefly into the blood capillaries and only a small amount passes into the lacteals. As a general rule soluble substances pass into the blood vessels. Hence we fail therefore to understand why thirst is said by the author to be peculiar to the lymphatic system. What then do we find in the lacteals which, as you know, are the lymphatic vessels in direct connection with the intestinal tract. These lacteals only differ from other portions of the lymphatic system in having a high absorptive activity. The lacteals contain chyle, which is white in color because it principally consists of fats in the form of a fine emulsion. Therefore we cannot see upon what foundation Dr. McLaughlin bases his contention that the lymphatics have a special function which changes the toxic character of chyme when absorbed because food substances are absorbed directly into the blood-vessels as well as into the lacteals, nor do we apprehend his contention that the lymphatic vessels continue and complete the task commenced by the alimentary system. We will not cavil at his statement that the lymphatics can absorb injurious and harmless substances alike and that the lymph glands have the power to arrest or change any foreign bodies, but in this connection we believe the function of the blood stream itself and its power to produce anti-toxin is much more effective in rendering any toxic materials

harmless. This wonderful antitoxin power of the blood is not sufficiently realized.

Next, we find a statement which astounds the reader: "Absorption while a function of dead tissue is antagonized by living tissue." Gentlemen, can anyone in the light of modern knowledge speak of dead tissue. Is not every particle and cell in the body composed of atoms which vibrate with an energy and a velocity than can mean but the very antithesis of the common meaning of the word death. Has not every cell in the organism within it a potential energy which can be converted into kinetic energy? Has every cell not the power of selection, assimilation, excretion and reproduction. Absorption means function, to functionate a cell must, we repeat, convert its potential energy into kinetic energy, and thus liberate force. Therefore, absorption calls for the essentials of life as represented by work accomplished.

We are asked to assume that the alimentary canal, the lymphatic system and the circulatory apparatus are empty when we begin the study of the tissue medium. We are told that on this assumption there is no blood in the mesenteric veins, so that absorption is impossible. Can we assume an impossibility? It may be denseness on my part, but I have not sufficient deductive reasoning to fathom the why and the wherefore. I use the word deductive because the author's reasoning is purely abstract. The author has presented an assumption for consideration, but the assumption to be of value must be based on the correctness of certain hypotheses or suppositions and we cannot follow him because his hypotheses are impossible and do not exist. These vessels are *never* empty and such a condition is unthinkable.

When we come to the discussion of the blood we are told: "The blood as it reaches the lungs is simply chyle," because we have to assume that the circulatory apparatus is empty and therefore it contains no tissue waste. How can we assume what is impossible and never exists because the blood as a fact when it passes from the right side of the heart into the lungs is filled with tissue waste, and it is not *chyle* but good venous blood. It would be just as easy to assume that H_2O would still be water if the

two molecules of hydrogen were removed. Then we are told that every phenomenon occurring in the blood while in the lungs results from the addition of oxygen to chyle.

We must go back, therefore, to a consideration of the functions of respiration. What is it that happens to the blood as it passes through the lungs? The hemoglobin held in the red blood cells of the venous blood as the latter passes through the alveoli of the lungs takes up oxygen from the respired air to form oxy-hemoglobin, and represents a loose chemical combination of the atomic compounds which readily gives up the oxygen to the tissues for oxidation processes. Oxygen is therefore *absorbed*, it is *not secreted by the lungs*, as we are told in the article. Oxygen, we assert, is *not added to chyle*, it is held by the red blood cells and not by the plasma. Dr. McLaughlin tells us: "My argument is that the lungs act on the blood before it reaches the tissues." This is an elementary physiological fact which no one disputes. If the lungs did not do so the tissue waste CO_2 , ammonia, etc., which they give off would very soon poison the organism and the want of oxygen destroy life. We cannot understand where the author of the theory obtained the impression that it is held by any physiologist that the blood is expected to pass through the lungs and the entire circulatory system, including the systematic lymphatics before it performs its functions.

Then when we come to the criticism leveled at the liver we are told that the author of the paper cannot accept the liver as an organ of digestion. Surely he is under a misapprehension, for the liver is not an organ of digestion but an organ intimately related to the general metabolism of the body. It is a great storehouse of carbohydrates and serves them out to the economy as they are required, it forms glycogen, which in a diffusible form passes into the blood stream, it has some relation to the breaking up of blood corpuscles and the formation of urea and metabolic products. It converts poisonous aromatic products of decomposition, *e. g.*, phenol, derived from proteids in the intestine into harmless compounds, and lastly it *secretes* bile. These are the functions of the liver and they are not digestive.

It plays a rôle in a certain period of development in the formation of blood corpuscles, but only to a very minor degree. Blood is not derived from bile and it plays no direct part in its formation in adult life.

Referring again to the bile, the author must surely be misinformed when he accuses investigators of accepting the theory that bile is a secretion as a trust handed down from first investigators. The speaker had the privilege of studying physiology under that great physiologist, the late Professor William Rutherford, Professor of Physiology of the University of Edinburgh, and the discovery of the bile pigments, bilirubin, biliverdin and bilicyanin, in fact, Rutherford was known at the 'varsity as "Bilirubin," and we can assure Dr. McLaughlin that "Bilirubin" accepted nothing in trust, and he proved fully that bile is a secretion, and at the same time he showed clearly the functions which are performed by the bile in the working of the organism. The author's conclusions that the bile and the pancreatic secretion are really excretions, have no concrete physiological data for a foundation. His assumptions are based on the abstract. In referring to this tissue medium in the lymphatics we have gathered that the author of the theory has not grasped the actual physiological function of these vessels. The lymph which permeates every tissue of the body, supplying the nutriment and enabling the tissues to get rid of the waste products resulting from their metabolism is collected and returned to the blood in special tubes, which we know as the lymphatics, but the lymph which they contain is supplied not by these lymphatic vessels but from the blood stream directly by filtration through the capillaries into the tissues. By some it is held that the lymph is to a certain extent also secreted by the cells of the capillary walls. Therefore the function of the lymphatic vessels is that of a collecting mechanism for returning the used up lymph and the waste products it contains to the blood stream for purification and a fresh supply of nutriment.

I have endeavored to place these physiological suggestions before you for your consideration, and I trust I have not utterly

failed to meet the task which was deputed to me. The criticisms are made with a view of stimulating others to like investigations, and to follow in the commendable footsteps of Dr. McLaughlin. The latter's contentions do him credit because they show he is seeking information and is one of those inquiring minds delving for truth, and if he be a physiological heretic all the more glory to him. Heretics are the salt of the earth, for they made men think and open their minds to liberty and truth. We need but turn to Biblical history, if you will but permit me to touch on so sacred a subject, and we will find that the greatest heretic this world has ever known is that commanding Presence and Figure which fills the pages of the New Testament.

A NEW VETERINARY ASSOCIATION ORGANIZED IN MINNESOTA.—Minnesota veterinarians living in and near the Twin Cities recently met and organized an association, to be known as the Twin City Veterinary Association. However, the members of the association wish to make it plain that any reputable graduate, whether in Minnesota or an adjoining state, will be welcome in membership and attendance.

It is expected that a considerable number of veterinarians practising at railroad points within convenient distance of the Twin Cities will take an active part with veterinarians from St. Paul, Minneapolis, South St. Paul and University Farm. Records show that there are eight licensed graduates in Minneapolis, eleven in St. Paul, sixteen in South St. Paul, seven at the University Farm. The purpose of this new association is mutual improvement in professional lines.

It is the plan of the present management to have at least one paper on each program that shall be distinctly educational along scientific lines. We wish to make it plain that this is to be in no sense another state association and is not to conflict in any way with our present state association.

Dr. F. D. Ketchum, South St. Paul, was elected president; Dr. L. Hay, Faribault, vice-president; Dr. Reynolds, University Farm, secretary.

NONE BETTER PRINTED.—A Minnesota veterinarian writes: "Enclosed find check and exchange for renewal to the REVIEW. None better printed."

THE UNITED STATES GOVERNMENT MEAT INSPECTION.*

By VERANUS A. MOORE, NEW YORK STATE VETERINARY COLLEGE, AT CORNELL UNIVERSITY, ITHACA, N. Y.

There is no public service in which sanitarians should be more interested than in the United States Government meat inspection. There is no other protective service in connection with food production that has been more difficult to establish, that has had greater obstacles to overcome, that has made more rapid progress and that has protected more people. Although the first legislation relative to federal meat inspection—that of August 30, 1890, and March 3, 1891—pertained more to the finding of a market for our pork and pork products than to safeguarding the people against unwholesome meat, it was the beginning of what has developed into a Federal meat inspection which compares most favorably with any other in the world. This is a strong statement, but it is not made with a spirit other than that of genuine appreciation that our government officials have profited by the experience of the pioneer nations in this work and have incorporated as far as possible the best of modern methods on the subject.

The law of 1906 authorized the Secretary of Agriculture to prescribe regulations for the careful inspection, for disease or other unwholesome conditions, of the carcasses of animals at the time they are slaughtered; to require the packing houses to be kept in a sanitary condition; and to inspect all meat and meat products before they are placed on the market. This authority applies only to those establishments which are engaged in export or inter-state trade. Following the enactment of this law, it was necessary for the Department of Agriculture to prepare and enforce regulations to cover the three essential points, viz.: The

* Read at the meeting of the United States Live Stock Sanitary Association, Chicago, Ill., December, 1913.

inspection of carcasses; the sanitary control of the establishments; and the reinspection of the meat and meat products.

The efficiency of a meat inspection service depends upon two important factors, viz.: The comprehensiveness of the regulations and the thoroughness with which they are enforced. The sanitary value and justice of the regulations are measured by the extent to which they embody protection against unsanitary handling of carcasses and the effect of disease and spoiled meat upon the consumer; and the degree to which they are enforced rests with the executive, educational and moral qualities of the inspectors.

In the growth of the present government regulations, it should be stated that under the legislation enacted prior to 1906 the Secretary of Agriculture had issued regulations relative to the inspection of animals before and after slaughter, and had prescribed rules for the condemnation of carcasses because of disease and injuries. These are known as Bureau of Animal Industry, Bulletin No. 9 (1895), Order No. 33 (1899), Order No. 125 (1904) and Order No. 137 (1906), and various amendments thereto. In the formulation of that part of the regulations pertaining to the disease of animals and the physical conditions that should condemn the carcasses, the experiences of other governments, especially Germany, were largely drawn upon. After the law of 1906, which extended the authority of the Secretary to the sanitary control of packing houses and to the inspection of the preserved meat and meat products, he appointed a commission to revise the regulations that were in force at the time the new law went into effect concerning the inspection of animals for disease. This commission was headed by Prof. W. H. Welch, of The Johns Hopkins Medical School. The commission recommended certain changes in the regulations then in force and these were adopted by the Department. The regulations of 1907, known as Order No. 150, and which are still in operation, are more rigid than those of other countries, in that they do not provide for the sale, under prescribed restrictions, of certain classes of meat which other countries utilize. The principle

underlying these regulations is that if an animal is diseased or injured in such a way that its flesh may be dangerous or unsafe for the consumer, its carcass shall be condemned. The regulations give to the consumer every possible protection. The extent of this protection is illustrated by the last report of the Bureau of Animal Industry, which states that during the year 1911 Government inspection was carried out in 939 establishments located in 255 cities and towns. There were 52,976,948 carcasses inspected, of which 117,383 were condemned and 82,710 passed for tallow and lard. In addition to the inspection of the carcasses at the time of slaughter 6,934,233,000 pounds of meat and meat products were inspected, and of these 21,073,577 pounds were condemned.

The qualifications of the veterinary inspectors are assured by the requirements imposed by the Government that, first: He must have graduated from a recognized veterinary college; and second, that he must have passed to a civil service examination in veterinary medicine. Again, to insure for the inspector a more thorough scientific training, the Department, some years since, prescribed the minimum requirements, in the way of curriculum, equipment and teachers, for the veterinary colleges whose graduates are eligible to take the examination.

In organizing the Meat Inspection Service under the law of 1906, the Government secured trained and experienced men to assist in formulating regulations for the guidance of the inspectors. Likewise the veterinary inspectors have been taken from those who have qualified by their special training and who have been successful in a competitive, technical examination. The meat inspectors are also trained men and skilled in the detection of tainted or sour meat. I do not know of any better mechanism for securing an efficient public service.

The sanitary control of the packing houses presents difficult problems. In many ways, they are more trying to deal with and harder to overcome than the inspection of the carcasses. The meat business, in this country, began in a small way and after the fashion of the country butcher. The killing and dressing of

animals for food has always been looked upon as a disagreeable task; because of the dirt and filth associated with it the inference seems to have been that the work should be done in a dirty place. With the growth of our population, business rapidly increased and necessitated such repeated additions to the slaughter houses that at the time the present law went into effect, there were many large, poorly planned, dark, unventilated structures. They conformed, however, to the general idea of the meat business at the time they were built and the public did not object to them then any more than the masses do now to the local uninspected slaughter houses. The law of 1906 required that the packing houses having Federal inspection be made sanitary. In response to this, the worst of the buildings were in some cases condemned, and in others were entirely replaced by new structures. The better ones were more or less remodeled. Windows and skylights were put in, the old, half rotten wooden floors were replaced by brick, or cement. The walls were either cleaned and painted or were rebuilt with brick, tile or cement. Toilets and dressing rooms for the men were put in, and ventilation, water and drainage supplies. Suitable benches, tables and trucks were provided for holding the viscera and for handling the meat. A system was instituted for frequent and thorough cleaning of the floors, walls and all tables, trucks and implements. The coolers were repaired. The wagons for transferring the meat were kept clean. In fact a great change took place. Actually millions of dollars were spent in bettering the conditions for the more sanitary handling and preserving of the meat and meat products. This work is still in progress. I have personally observed in New York, Buffalo and Philadelphia extensive building operations in connection with the packing house business, and I am informed that the same is true in other places. While there still remains old buildings, there is not to my knowledge a single packing house having Federal inspection that is not kept clean and in such a sanitary condition that meat can be handled within it in a wholesome manner. I know of no other industry where such large expenditures have been made in so short a time to improve the conditions for protecting the product.

In the evolution of our meat inspection service teachers as well as pupils have had to learn. Nowhere in Europe is slaughtering done on so large a scale as in this country. There is still much to learn about almost every feature of the packing house business with reference to the best facilities and methods of inspection. But the splendid co-operation usually existing between inspectors and packers will hasten the time when throughout the establishments the most desirable equipment will be installed and the most sanitary methods for inspecting and handling the meat will be employed.

Although the Bureau of Animal Industry has enforced a thorough meat inspection, with every year showing improvement over the previous one, there have been numerous and unjust criticisms of the work. Its very success is a challenge to the destructive critic. There is no one more familiar with the weak places in this service and the difficulty in correcting them than the Department itself. Seven years ago our Government stepped into the business offices of hundreds of establishments and practically said to the proprietors, "You must submit to our directions regarding the condemnation of carcasses and preserved meats. You must put your establishment in a sanitary condition, you must do as we say or you can not continue your business." More trying than persuading the packers of the justice of this new regime was the necessity of employing hundreds of inexperienced veterinarians to enforce the new law. This was a herculean task for the Department of Agriculture. However, the law was obeyed and a great reform took place in the sanitary methods of handling and inspecting meat. While criticisms have been frequent, I have failed to see in the public press any statement concerning the splendid work of the Department and the wonderful progress which has already been made in safeguarding the public against unwholesome meat food. The insanitary and filthy slaughter houses have been transformed under inspection into sanitary places where meat is handled in a cleanly manner. The packers have learned that good sanitation in their places of business is a valuable asset. The meat inspection service can never

be perfect because of the human element involved. Accidents will happen, mistakes will occur and errors in judgment will be made. These will exist under any system that can be devised.

An analysis of the criticisms will show that they are petty, being based on some error or accident or more general attack upon the service. They are largely along two lines, namely, administrative and faulty regulations. The administrative complaint has been largely in connection with the Service Bulletins. A careful study of these Bulletins shows that they are virtually letters of instruction from the Chief of the Bureau to the Inspectors, and necessarily are not of general interest to the public. They are in the interest of efficient inspection and nothing else. The objections to the regulations seem to be confined to the fact that the flesh from animals in which there are certain localized infections or injuries is allowed to pass into the meat supply. These criticisms are based on the aesthetic rather than the sanitary consideration of the subject.

The time seems to have come when a statement of a few principles which should control meat traffic and meat inspection would be helpful. The purpose is to care for animals in such a way that they will remain well, and when they are dressed for human food to handle the carcasses in a cleanly manner. The inspection implies that they shall be condemned if they are found to be diseased, and passed if they are sound. It is well to remember that technically these are relative terms. The so-called sound bullock may be carrying in his intestines the bacilli of tetanus, botulism and malignant oedema. If from the south his blood may be able to produce Texas fever in susceptible cattle; his heart muscles may be loaded with sarcosporidia; and the walls of the stomach and intestines may be infested with animal parasites. More than this, there may be the organized remains of pneumonia, pleuritis, or peritonitis and the scars of former fractures of ribs and limbs may be found.

Among the infectious transmissible diseases may be mentioned anthrax, rabies, foot-and-mouth disease, tuberculosis, paratyphoid infections and trichinosis. The flesh of animals in-

fectured with these diseases is not known to be dangerous to man after thorough cooking, if we except those affections due to the group of paratyphoid or paracolon bacilli. This statement has a broad historical basis, for in centuries past flesh from animals thus affected was frequently or even regularly consumed. Each disease has to be considered by itself, if we wish to single out and define the danger to man. The real danger in such diseases as anthrax, rabies and glanders lurks in the handling of the carcass and in eating the uncooked meat by the unsuspecting purchaser and in the further dissemination of the specific infection. Hence all traffic in any or all portions of carcasses affected with these diseases is prohibited. Trichinous pork is harmless to manipulation but highly dangerous as an uncooked food.

An examination of the field of animal pathology shows that we actually have few ideally healthy animals. It is hardly to be expected that we should have. The abnormalities encountered are of many kinds, ranging from mere carriers of virus to various stages of local or general diseases. The trained inspector's function is to save meat wherever that can be done, rather than to reject it. The process of rejection is easy, but there would be little meat handled and sold if every minor blemish were counted against the animal.

As a result of this state of affairs, we find inspection of meats governed by different regulations in different countries. The meat inspection laws of Germany are far less exclusive, but at the same time more highly developed and worked out in more minute detail than in this country. As Smith has pointed out, diseased meat is there defined solely in accordance with the potential danger to the health of the human species and to other still healthy animals. Meat is classed as utilizable, non-utilizable and of inferior grade. A fourth class is created which is utilizable only under certain restrictions. These are that it be sold after sterilization at a lower price and only in small quantities to any one purchaser. In Germany a considerable percentage of animals which our Government inspectors condemn are used for food.

There are many problems for the authorities to settle in the

conduct of the meat inspection service and the proper classifications of meat and meat products based on their nutritive value and the physical state of the animals from which they come. The details are intricate and complicated. There are other serious questions relative to the spread of certain diseases of animals where the virus is known to be present in the tissues for several days before the disease can be detected by either symptoms or tissue changes. These problems will eventually be solved and the troublesome questions answered "if our Government inspection is continued as a scientific, non-political and strictly civil service organization."

In the final adjustment of our meat inspection a number of changes will undoubtedly be made. The economic or financial aspect of the whole problem will be of no small importance. The strictness with which animals will be condemned because of local conditions or slight disease will eventually be governed by the law of supply and demand. If our meat supply becomes a continuously diminishing quantity, our standards will change and we shall come down more and more to the question of healthfulness, irrespective of other considerations. Because of the general popular misconception at the time the present law was enacted, regarding the dangers to the human family from diseased meat, the regulations of our Government are in some respects severe. We were not ready to accept the classification of meat foods as recognized in other countries. In this work we are still young. To attain perfection in equity to the live stock owners and protection to the public from our Government meat inspection service, we must abide the ripening influence of years.

The lesson for veterinary sanitarians to learn from our Government inspection and to teach in their respective communities is the need for municipal and State inspection that will insure to the people of the country protection against locally killed meat and the insanitary methods of handling it. With our best animals going to distant markets and the others left for the uninspected slaughter houses, it is easy to understand why locally killed meat may be inferior to that of the inspected houses. A State and

municipal inspection would be of great service in finding the centers of infection in our farming community, thereby making it possible to eradicate the infectious diseases from the locality. Further, it would educate cattle owners in the necessity of exercising great care for the protection of their stock. With about forty per cent. of our meat and meat products still uninspected, we can not hope for the maximum benefits of such a service. As sanitarians, it would seem that our first duty in this matter is to support the efforts of our Government in building up an efficient meat inspection service and our second duty to use our influence in extending its benefits to the country as a whole by supplementing it with the institution of Municipal and State Meat Inspection.

VETERINARY CONFERENCE AT ITHACA.—By authority of Director Moore, of the New York State Veterinary College at Cornell University, Ithaca, N. Y., we announce the date of the annual conference of veterinarians as January 8 and 9, 1914. There will be an unusually interesting list of speakers; among them Dr. John Adams, of the University of Pennsylvania, and Dr. Theobald Smith, Professor of Comparative Pathology at the Harvard Medical School, who will discuss the subject of vaccines. Mr. J. C. Buckley, editor of the *Horseshoers' Journal*, and President of the National Horseshoers' Association, will address the gathering. Commissioner Huson, of the State Department of Agriculture, has also promised to give an address on "The Relationship of the Veterinarian to the State." An interesting clinic is assured, and no veterinarian that can possibly attend should miss the opportunity of participating in this great educational function.

YOU MUST SHOW THE MAN FROM MISSOURI, and the following from a Missouri subscriber would indicate that we had, as in renewing his subscription he says: "I do not want to miss a single copy; I appreciate your efforts to keep the REVIEW up to its high standard. You have done the profession a lot of good in the past, and *deserve* the confidence and good will of the veterinarians of this country, both of which you have."

PURE MILK PRODUCTION AND THE ABORTION BACILLUS.*

By E. C. SCHROEDER, M.D.V., SUPERINTENDENT, BUREAU OF ANIMAL INDUSTRY
EXPERIMENT STATION, BETHESDA, MD.

The dangers incident to the use of raw milk remain too commonly undervalued, notwithstanding that available evidence proves that it is impossible to produce milk, under the most favorable, economically obtainable conditions, unfailingly free from pathogenic contaminations, or free, even (a matter of primary importance to veterinarians) from those agents of disease that propagate within and emanate from the bodies of dairy animals. Too many physicians and, under their influence and guidance, too many other persons, on the basis of hypothetical objections, remain averse to the use of heat to neutralize dangers that may be hidden in raw milk of seemingly the best quality, or perfect milk according to all tests that can be applied to it before it is too old for use. Such dangers are unsuspected until they are revealed too late by the harm they have done so often that it is difficult to convince those who have escaped them that they are real and serious and not rarely fatal, or that an article of food, in itself harmless, wholesome, nutritious and practically indispensable, repeatedly serves as a medium for the multiplication and dissemination of virulent disease germs, and that it is one of the commoner sources to which epidemics are traced with unquestionable certainty. And, unfortunately, much of the harm done by the use of raw, contaminated milk is so insidious in its development that a true conception of the magnitude of raw milk dangers is often defeated by the fact that most of us can point

* Presented to the Fiftieth Anniversary Meeting of the American Veterinary Medical Association at New York, September, 1913.

to instances in which inferior, stale and bacteria-laden milk has been consumed in large quantities without doing harm that is traceable to it.

Hence, the object of this short paper is less to define one of the more recently discovered dangers that needs mature consideration in all attempts to produce pure milk, than to make a new appeal to good, sound sense against the use of milk in its raw state, by presenting an addition to the ever-increasing, irrefutable evidence that supports the conclusion, almost unanimously indorsed by sanitarians who have studied the milk question, that all milk should be made truly safe by pasteurizing, scalding or boiling it before it is used as food.

The bacillus of infectious abortion of cattle is an extraordinary organism; it is capable of affecting widely different species of animals; the lesions it causes in some species are wholly unlike those it causes in others; it has the faculty of maintaining itself long periods of time in living animal tissues without causing macroscopically discoverable lesions; it may live, weeks and months, in the living tissues of such widely different animals as monkeys, pigeons, rabbits, rats, mice, guinea pigs and cattle; (1) it may occur in the milk of cows months before it causes them to abort; it has been found in the milk of cows that have not aborted and which afterward, without aborting, while the bacillus continued to occur in their milk, produced a succession of healthy calves at full term, and many cows that are invaded by it, if not most, as indicated by tests at the experiment station, become chronic carriers of it and continue to expel it from their udders with their milk indefinitely. In several cases, under continued observation, repeated tests proved that it remained as a contamination in the milk of infected cows two, three and longer than four years.

The long persistence of the bacillus in the tissues of animals has a parallel in the continued persistence of tubercle bacilli in the tissues of even those animals for which they are not truly pathogenic, but in one respect it is a wholly different phenomenon. Tubercle bacilli persist in localized, usually encapsuled lesions,

which soon lose the character of living tissues, while the abortion bacillus is diffused throughout one or more organs in which frequently no lesions can be discovered. Whether it multiplies during its residence in such organs, as it certainly must in the udders of infected cows, or whether it is simply stored in them until it is slowly and gradually destroyed, remains an unanswered question.

Another unanswered question is whether it actually injures human health? In the report of the British Committee appointed by the Board of Agriculture and Fisheries to inquire into epizootic abortion, the following significant statement is made: (2)

“Although it is hardly germane to the present inquiry, we think it advisable to point out that, since the bacillus of infectious abortion of cattle is pathogenic for so many species, the possibility of the human female being infected should not be lost sight of.”

This statement was made before it became known that the bacillus is of common occurrence in the milk of cows, or that it occurs in milk at all, and hence, before it was known that human health is repeatedly and directly exposed to it through the use of raw milk and other dairy products derived from raw milk.

Dr. Theobald Smith, (3) whose judgment we should know how to value, in an article on the abortion bacillus by himself and Marshall Fabyan, called attention to the possibility that it may cause disease in persons, and, only recently, at the last annual meeting of the American Association of Medical Milk Commissioners, Larson and Sedgwick, of Minnesota, reported that they had made 425 complement deviation tests with the blood of children, in which the abortion bacillus was used as the antigen, and that they had obtained 72 or 73 positive reactions. The claim was made in connection with these tests that the proportion of reactions would have been greater had the tests been confined to children fed on raw cow's milk, and this claim we can readily credit when we know that the abortion bacillus is capable of maintaining itself for many weeks in such dissimilar environ-

ments as the living tissues of monkeys, pigeons, various rodents and cattle.

Most bacteria that gain entrance to the living tissues of animals for which they are not pathogenic disappear quite rapidly, and bacteria also disappear quite rapidly from the living tissues of animals for which they are virulent after immunity against them has developed. In this respect the long continued persistence of the bacillus of infectious abortion in the living tissues of different species of animals may be looked upon as a significantly important form of parasitism to which human bodies should not be subjected.

We may say, relative to the bacteria against which human health should be guarded, that it is questionable whether repeated exposure to a bacterium, pathogenic for any species of mammals, can be practised with impunity; that it is dangerous to permit repeated exposure to any bacterium that is pathogenic for several species of mammals, though it may be, as far as we are informed, harmless for human beings, and that it is a deliberate invitation to disease to permit repeated exposure to a bacterium, like the abortion bacillus, that is pathogenic for widely different species of mammals and is known to cause changes in human bodies that can be detected by complement deviation or other bio-chemic tests or tests of any kind.

And now, as the importance of a menace to public health depends largely on the frequency with which exposure to it occurs, let us examine the available data on the occurrence of the abortion bacillus in the commercial milk supply.

During the years 1893 and 1894 I made a number of tests, under the direction of Dr. Theobald Smith, who was then in charge of the Division of Pathology of the U. S. Bureau of Animal Industry, on the occurrence of tubercle bacilli in the milk supply of Washington, D. C. Among the guinea pigs injected with milk one showed lesions on post-mortem examination closely resembling tuberculosis, but in which no tubercle bacilli could be found. Dr. Smith studied the lesions and, in a foot note to my report on the milk tests, described them with so much precision

and clearness that no one informed on the subject can read his description now without recognizing that they were the characteristic, almost unmistakable lesions caused in guinea pigs, as we have since learned, by the bacillus of infectious abortion of cattle. (4) Subsequently, abortion disease was not again found in guinea pigs injected with milk, or if found was insufficiently described for recognition, until the year 1907, when a number of guinea pigs injected at the experiment station with samples of milk from the Washington supply showed lesions easily mistaken for tuberculosis, but in which tubercle bacilli could not be found after prolonged search. The failure to find such lesions between 1894 and 1907 can possibly be explained by the small number of milk tests with guinea pigs made during this interval of about 12 years, as abortion disease in milk-injected guinea pigs has been far from uncommon at the experiment station during the last six years.

The disease in the guinea pigs was soon proved to be transmissible from guinea pig to guinea pig through the inoculation of small fragments of affected organs, and its cause was traced through guinea pig injections to its source in the udders of seemingly healthy cows. Beyond this it remained a puzzle until the year 1910, in which improved facilities for bacteriological investigations at the station enabled Cotton and myself to isolate a bacillus from affected guinea pigs and to prove it to be the true cause of the disease. The bacillus, at first believed to be a previously undescribed organism, was the subject of two papers in 1911, one presented to the American Association of Medical Milk Commissions (5) and the other to this association, (6) and was definitely identified in 1912 as the bacillus of infectious abortion of cattle. (7)

Without entering into lengthy details about experiment station milk tests, made under my supervision by Drs. Cotton and Brett of the station, the factors brought out, pertinent to the subject under consideration, are the frequency of the bacillus of infectious abortion, as shown by guinea pig injections, in all samples of milk tested from 1907 to 1912, inclusive; the relative

frequency of contamination, respectively, in 1907 and 1912, and the frequency with which the milk of individual dairies is contaminated.

From 1907 to 1912, inclusive, 516 samples of milk from 90 different dairies were injected into 1,068 guinea pigs. Among the guinea pigs 237 died prematurely from intercurrent affections, and among the remaining 831 abortion disease was found on post-mortem examination in 103, or over 12 per cent. The infected milk was obtained from 29 different dairies, showing that nearly one-third of the dairies included in the tests from time to time distributed milk contaminated with living abortion bacilli. The same tests yielded 10 cases of tuberculosis, which were chargeable to the milk of seven different dairies.

Some of the milk tested was sold as pasteurized; in two samples of this living abortion bacilli, and in one sample living tubercle bacilli were found, proving that commercial, unsupervised pasteurization is not reliable. And some of the milk was sold as "special milk," probably "special for infant feeding," and this caused two cases of abortion disease, proving that the name "special" is no guarantee against living disease germs in milk.

That commercially pasteurized milk, pasteurized without satisfactory, official supervision, at times causes abortion disease and tuberculosis in guinea pigs injected with it, should not be construed as a charge against the efficiency of pasteurization to check milk dangers due to living pathogenic agents. At the experiment station many hundreds of guinea pigs have been injected with milk known to contain either or both abortion and tubercle bacilli, some with portions of the milk in its raw state and others with portions of the same milk, obtained at the same time, from the same sources, in the same containers, after it had been pasteurized by station employees at 60 degrees C. (140 degrees F.), maintained for 20 minutes. In no instance, among these hundreds of guinea pigs, was either tuberculosis or abortion disease caused by the injection of the pasteurized milk, while nearly all of the guinea pigs injected with this infected

milk in its raw state contracted either or both abortion disease and tuberculosis.

In the year 1907, 36 samples of milk from 32 different dairies were injected into 72 guinea pigs. Among the guinea pigs nine died prematurely from intercurrent affections, and among the remaining 63 abortion disease was found on post-mortem examination in eight, or over 12½ per cent. The infected milk was obtained from five different dairies, or over 15 per cent. of those included in the tests. The tests yielded three cases of tuberculosis, which were chargeable to the milk of two different dairies.

In the year 1912, 77 samples of milk from 40 different dairies were injected into 154 guinea pigs. Among the guinea pigs 69 died prematurely from intercurrent affections, (8) and among the remaining 85 abortion disease was found on post-mortem examination in 26, or over 30 per cent. The infected milk was obtained from 15 different dairies, or 37½ per cent. of those included in the tests. The tests yielded two cases of tuberculosis, which were chargeable to the milk of two different dairies.

A number of tests on six, eight, ten or more consecutive days were made with milk from several large dairies, and these proved that most distributing dairies that sell milk collected from a number of different farms can be shown, if a sufficient number of tests are made, to be vending milk that is intermittently contaminated with abortion bacilli.

We may tabulate the results of the tests as follows: Six-year period, 1907 to 1912, inclusive, 30 per cent. of all dairies tested more or less seriously infected with abortion disease; one year, 1907, 15 per cent. of all dairies tested infected; one year, 1912, 37½ per cent. of all dairies tested infected.

The force of this evidence is strengthened by the fact that a sufficient number of tests with the milk of almost any large distributing dairy will sooner or later reveal abortion disease.

No one, it seems, can contemplate the facts without realizing that the frequency of abortion disease among dairy cattle is increasing at an alarming rate. Possibly the conditions among cattle elsewhere are not as serious as in the environment of the

District of Columbia, at least, it is sincerely hoped that this is the case, but whether it is or no the great frequency with which the abortion bacillus occurs in the commercial milk supply of Washington, and the increasing frequency with which milk is infected with this remarkable organism, which seems to belong in a class by itself, should convince us that milk, pure enough for use in the raw state, can not be produced anywhere.

The difficulties attending the production of milk free from the abortion bacillus are well illustrated by an investigation at the experiment station on the relative value of raw, pasteurized and boiled cow's milk as a food for young animals. In the investigation 467 guinea pigs were fed artificially on cow's milk from birth until they were weaned. One-third of the young animals received raw milk. Though unusual care was taken by men who are well informed on the nature and sources of milk contaminations to obtain milk of the purest kind for the investigation, from station cows that were under constant supervision, it was found before the investigation, which extended over several years, was concluded, that some of the guinea pigs which were fed raw milk had become infected with abortion disease. It may be well to add that it is not difficult to infect guinea pigs with abortion disease by feeding them milk that contains the abortion bacillus, and that the investigation proved that boiled cow's milk, from every point of view, is a more satisfactory food for young guinea pigs than raw cow's milk.

I am convinced, if we had no other contamination in milk to deal with than the abortion bacillus, and it is only one of many dangers, some of which are more definitely known to attack human health, it would be amply sufficient to justify the conclusion that it is imperatively necessary to resort to heat as a simple and inexpensive expedient to make all milk safe before it is fed as food.

But we should not permit the availability of so simple and economical an expedient as heat to lead to a relaxation of those precautions that insure the cleanliness, freshness and general excellence of milk, because carelessness, lack of cleanliness, the

retention of diseased animals in dairy herds, etc., etc., engender milk dangers that cannot be corrected by heat.

What we should strive for is the cleanest and best, the freshest and purest milk that can be produced, made safe by its exposure to heat under competent, reliable, official supervision.

REFERENCES.

- (1) Marshall Fabyan, *Journal of Medical Research*, Vol. XXXVIII, No. 1.
- (2) Report of English Committee, Part I., page 15, London, 1905.
- (3) Theobald Smith and Marshall Fabyan, *Centralblatt für Parasitenkunde und Infektionskrankheiten*, Vol. 61, No. 7.
- (4) E. C. Schroeder, Bureau of Animal Industry, *Bulletin* No. 7.
- (5) Proceedings of the American Association of Medical Milk Commissions for the year 1911.
- (6) Proceedings of the American Veterinary Medical Association for the year 1911, also *AMERICAN VETERINARY REVIEW*, Nov., 1911.
- (7) Bureau of Animal Industry, Circular No. 198.
- (8) The high mortality from intercurrent affections during the year 1912 was largely due to the milk of one or two dairies, from which samples were secured and injected into guinea pigs on a number of different days and which almost invariably caused acute, rapidly fatal peritonitis.

IMMIGRATION—DOMESTIC AND FOREIGN is the title of an address delivered before the Mississippi Valley Immigration Association, recently, by Dr. W. H. Dalrymple, of Baton Rouge. The doctor stated amongst his strong arguments in favor of immigration to his adopted state: "Perhaps the most emphatic indication of Louisiana's need of immigration (and this may also apply to other Mississippi Valley states) is her approximately 23,000,000 acres of practically idle land that simply await the touch of the intelligent agriculturist, to yield bountifully of almost any farm crop that can be grown, and its possible maintenance of endless numbers of any and all of the varieties of farm animals, more particularly those which we term the food-producing class—beef cattle, dairy cattle, hogs and sheep." That surely sounds encouraging, and that and a hundred equally impressive statements, put forth by the doctor in his earnestness and enthusiasm, should, if distributed before the right people, bring many, agriculturally inclined, to the Mississippi Valley and increase the field of the veterinarian in the South.

THE next annual meeting of the Tennessee Veterinary Medical Association will be held in Nashville some time during the month of November, 1914.

ELIMINATION OF SOURCES OF CONTAMINATION IN MILK.*

BY W. D. FROST, PH.D., DR., P.H., ASSOCIATE PROFESSOR OF BACTERIOLOGY,
UNIVERSITY OF WISCONSIN.

Meaning of Contamination.—In considering this subject it seems necessary at the very start to define the sense in which the word contamination is to be used. It may be used to mean the entrance into milk of any and all foreign matter, such as dirt or bacteria. In this sense all milks are contaminated, except perhaps some of the certified or, as we might call them, the aseptic milks; but such milks are impractical for general use. On the other hand, we may consider contamination in a broader sense to mean the pollution of milk with material that is likely to endanger the health of those who use it; such a milk has a dangerous taint; its consumption jeopardizes the health of those who partake of it. The word is used in the latter sense in the present paper. According to our present knowledge it is not possible to produce milk on a large scale that is uncontaminated in the narrow sense, but it is possible and profitable as well to produce a milk that is free from danger to those who use it.

It is now quite generally recognized that milk as it comes from the udder of the healthy cow is not germ free, but, contrarywise, may contain a considerable number of bacteria. Such a milk, however, gathered with reasonable care, should not be considered contaminated. A contaminated milk contains either disease-producing bacteria or an excessive number of harmless bacteria, which, though harmless in themselves, may be harmful in large numbers. This form of contamination, because of its

* Presented to the seventeenth annual meeting of the U. S. Live Stock Sanitary Association, Chicago, December, 1913.

frequency, is most serious, especially where such milk is fed to infants.

The contamination of milk needs to be considered not only from the standpoint of public health, but also in regard to its keeping qualities. If a milk could be secured with no greater contamination than it has in the udder of a cow its keeping power could be measured in days where a contaminated milk might keep only as many hours. A milk so contaminated that its keeping power is short disgusts the consumer, and like a "boomerang" comes back to both producer and purveyor in decrease sales. The production of an uncontaminated milk is a subject worthy of the most serious consideration and of sufficient importance to engage the attention of the ablest workers.

The Cow as a Source of Contamination.—The diseases transmitted from the cow to man through milk are anthrax, Malta fever, foot and mouth disease, milk sickness, mammitis, septic sore throat and tuberculosis. Most of the diseases in this list are, now-a-days, fortunately only remotely serious, but deserve a word in passing. *Anthrax* readily effects cows, but, due to the rapid course of the disease which ends in death in a few hours, the milk is suppressed or rendered so abnormal that it is not likely to be used. The anthrax bacillus has, however, been recovered from cow's milk. That the dangers from this disease are within the range of possibilities was shown by an epidemic of this disease which occurred among the herds supplying the City of Chicago. In 1910, five hundred cows were exposed and eighty-seven became infected. All milk from the farms where the disease existed was destroyed and great care was taken to prevent the sale of milk from the suspected districts, and as a result no human cases were attributable to milk infection.

Cows are susceptible to the germ of Malta fever and this germ has been found in their milk. The infection of man, however, from this source is not recorded although goat's milk is the usual means of transmission in this disease.

Foot and mouth disease which occurs in cattle can be transferred to men, especially children, through the milk, and five epi-

demics of this kind have been reported in this country. The disease is widely prevalent in Europe and Asia.

Milk sickness was formerly important, but is now practically unknown in the United States, except in sparsely populated portions of North Carolina, Tennessee and Texas.

Mammitis, mastitis or garget, is a common and well recognized infection of cows. It is caused by various germs, but especially by streptococci and staphylococci. The milk from an infected cow can give rise to gastro-intestinal disorders, especially in children. The milk from such cows can usually be detected by a microscopical examination of the sediment. A milk sediment containing an excessive number of leucocytes, particularly when they are associated with streptococci, is regarded by some workers as almost invariably coming from infected herds. Some milk firms make routine sediment tests and report pus and streptococci to the producer, who it is claimed can usually locate the difficulty without trouble. If the gargetty udders are not readily found the milk from each individual cow is then tested with the usual result that the offending cow is found. Savage, of England, has carefully studied this condition, and fortunately is able to come to the conclusion that "the great majority of cases of bovine mastitis are due to an organism which is not harmful to man."

Closely associated with mammitis in cows is the question of the relation of septic sore throat to milk. Savage and Trask have collected the histories of twenty outbreaks of milk-borne sore throat which have occurred in England. Most of these epidemics have occurred in recent years. In this country we have all been startled by the appearance of several frightful epidemics. This disease appeared first in Boston in 1911, and since then in Baltimore, Concord, N. H., Chicago and elsewhere. The evidence is not sufficient to warrant a dogmatic statement in regard to the way in which the milk becomes infected in this disease, but until we know differently we are bound to regard mammitis and other streptococcus infections of the udder as a possible if not a probable source of infection. The tremendous morbidity and mortality

among the consumers as well as the financial loss among the producers of such an infected milk make the relation of septic sore throat to milk one of the great problems of the day.

Tuberculosis is a chronic disease of both the cow and man. That these diseases are intertransmissible there can not be the least shadow of a doubt. The only question is what per cent. of human tuberculosis is of bovine origin. We know that in all probability milk from infected cows is responsible for from a fifth to a fourth of the tuberculosis of infancy and childhood, and that is the source of from five to seven per cent. of all human tuberculosis. Some believe that it is even more important than that. Certain it is that its eradication is of sufficient importance to demand the best endeavors of all who love humanity and own cattle.

The elimination of these animal sources of contamination can be accomplished by testing with tuberculin all cows used in the production of milk and removing from the herds the reacting animals. Garget should be constantly in mind and when present the entire milk of the infected animal should be discarded so that it does not become human food. Sick cows, from whatever cause, are not proper sources of food for man. The danger from this source of contamination, namely the cow, can only be eliminated by eternal vigilance.

Health Tone of Cow.—The early idea that milk from a healthy udder, with proper care, could be obtained in a sterile condition is not in keeping with the facts as we know them. As a matter of fact, experience has shown that the most extreme care will not assure a milk with less than several hundred bacteria per cubic centimeter. It is further known that certain cows give an excessively high count in freshly drawn milk, *i. e.*, upwards of a hundred thousand. Whether such cows are in a perfectly normal condition or not is perhaps a matter of doubt, but one worthy of further study. Frost and Meyer already made some suggestive observations in this direction. They made a study of bacterial content of the milk from a series of cows from a certified herd in which it was shown that the only cow of the group studied having an excessively high count was the one which had been continu-

ously stabled for a period of six years. This work needs confirmation, it does not seem unreasonable to suppose that unnatural conditions such as continuous stabling and forced feeding would lower the health tone of an animal so that the natural germicidal properties of its body fluids would be subnormal, thus permitting the development of an abnormally high bacterial flora.

Contamination Through Handling.—In the handling of milk, opportunity for serious contamination occurs at several points. The sources of this contamination are: The exterior of the cow; the barn dust; the utensils; and the milker.

Fecal Bacteria in Milk.—From the coat of the cow come a great number and variety of bacteria, but perhaps the most dangerous are the fecal bacteria, or those belonging to the colon group and the sporogenes capsulatus group. The presence of these bacteria in milk is significant not only because they indicate manurial contamination, which in itself is undesirable, but because they may themselves at times at least possess pathogenic properties.

This source of contamination can be largely eliminated by comparatively simple precautions. The hind quarters of the cow should be brushed or curried at least one half hour before milking. The udder and flanks should also be washed with clean or sterile water and wiped with a clean towel. Under all conditions milk produced for direct consumption should be gathered in narrow topped milk pails, which reduce this source of contamination to a minimum.

Barn Dust.—The bacteria which come from the barn dust are of comparatively little importance to the careless producer, since in his case the lactic acid bacteria almost invariably overrun the air bacteria, but to the more careful producer they become a greater problem. These bacteria, in so far as they effect milk, are usually digestors, *i.e.*, they act on the protien rather than on the sugar of milk. The better grades of certified milks usually have these digestors in relatively large enough numbers to determine the character of the fermentation, as it has been my experience that such milks digest rather than sour on standing.

This source of contamination can be minimized by observing reasonable care in conducting the affairs of the barn. These particular bacteria are abundant in the dust from the field. This should then be so handled and at such times as to avoid dust at milking time. The same is true of the bedding and the dust from the currying of the cows.

Milking Utensils.—The care of the milking utensils is a matter of very considerable importance, since from this source come enormous numbers of lactic acid bacteria, as well as other kinds, whose presence in milk are of the greatest significance so far as the keeping qualities of the milk are concerned. This factor also is not without its sanitary significance, since many epidemics are on record as having their origins in the fact that bottles have been returned from infected households, refilled and distributed without being properly sterilized.

Contamination from this source can be easily eliminated where steam is available, since the effect of even a few minutes exposure to live steam is sufficient to kill pathogenic bacteria. In other cases much the same result can be obtained by the use of hot water. In the absence of hot water treatment with a suitable solution of chlorinated lime will be efficient.

The water supply of the dairy is a matter of the gravest concern. Its quality should be above reproach.

It should be stated in this connection that the handling of milk is a great multiplier of bacteria, and as a corollary that on this account milk should be handled as little as possible.

The Milker As a Source of Contamination.—The milker is no doubt the most serious source of contamination, since through him come the pathogenic germs which produce the most dangerous and widespread epidemics attributable to milk. These epidemic diseases are typhoid fever, scarlet fever, diphtheria and septic sore throat. There is no reason to doubt that the cause of these diseases in milk epidemics always enters through the handling of the milk by diseased persons, by "carriers" of these diseases, or through the water supply. To show that the dangers from this source of infection is not simply theoretical but has its

practical importance, one has only to turn to the literature of the subject. Our knowledge of milk-borne epidemics was summarized by Trask in 1908, and from him we learn that upwards of 500 epidemics have occurred and that 317 of these were typhoid fever, 125 were scarlet fever, 51 were diphtheria, and 7 were sore throat infections. The number of cases in these various epidemics have ranged from one or two to over 800. The largest number of cases in any one epidemic of typhoid fever was 362, in scarlet fever 813, in diphtheria 264, and in septic sore throat 7 (but it should be remembered in this connection that there were over 2,000 cases in the Boston epidemic of 1911).

The elimination of this cause of contamination is the most serious problem confronting the conscientious dairyman of today. It is quite easy to debar from milk-handling workmen who are actually sick and it would seldom happen that well-marked cases of disease would be the source of infection, especially in the larger plants. One trouble comes from the fact that during the prodromal stages of diseases, such as scarlet fever, they are quite as infectious, if not more so, than when these diseases are well advanced. Still more difficult is it to detect the "bacillus carriers," which are common in all these diseases. In the present state of our knowledge their detection is impossible.

What should be done—and the public can reasonably expect that it will be done—is to minimize the danger from this source by allowing only well people to milk; to temporarily debar from milking or handling the milk any who are ill, especially if such indisposition be in the nature of a sore throat, and particularly if this symptom appear in a young person who has not had diphtheria or scarlet fever. A person should not be allowed to milk who has a fever or who has diarrhoea. Nor should one be allowed to handle milk who comes in contact with anyone sick of an infectious disease. Where possible, all employees should be periodically examined by a competent physician, and while ill an employee should receive the usual compensation, otherwise he will not report slight, but nevertheless dangerous, indispositions.

It seems also well within bounds to require that all milkers

should have reasonably clean clothes, clean hands and good habits; such for example as would keep him from wiping his nose on his hands, as I have seen men do in capping bottles.

Flies should be kept out of milk and the dairy if possible. Cans and bottles should be so sealed as to prevent infection during delivery, for it must not be supposed that all of the contamination occurs on the farm—it may occur enroute to the city, in the city plant and on the premises of the consumer.

Finally, fine equipment of farm, dairy or pasteurizing plant is always to be commended, but by the same token it is always to be remembered that intelligent and painstaking care are the important essentials in the handling of milk.

SOME LEADING ARTICLES FOR OUR NEXT ISSUE.—Studies on the Virus of Hog Cholera (Walter E. King and Associates); The Control of Glanders in New York State (J. F. De Vine); Bovine Coccidiasis (Horace B. Jervis); The Diagnosis of Dourine by Complement Fixation (Mohler and Eichhorn); A Preliminary Report on the Value of Leucocytic Extract from a Therapeutic Standpoint (R. A. Archibald); The Control of Hog Cholera by Slaughter Methods (Geo. E. Hilton); The Present Status of the Control of Tuberculosis by Vaccination (S. H. Gilliland and C. J. Marshall); Tetanus (M. D. De Turk) and several others.

PERIODICALS RECEIVED AT THE REVIEW OFFICE.

Semi-Monthly Bulletin—Live Stock Sanitary Board (Penn.)
 Bulletin Washington State Agricultural College.
 Canadian Medical Association Journal.
 Quarterly Bulletin—Chicago Veterinary College.
 The Bacterial Inerapist.
 The Veterinary Journal (London).
 The Live Stock Journal.
 The Pacific Dairyman.
 Hoards Dairyman.
 Farmers Advocate.
 The Breeder's Gazette.
 The American Journal of Clinical Medicine.
 The Cornell Veterinarian.
 The Philippine Agricultural Review.
 The Agricultural Journal (South Africa).
 The Rider and Driver.
 The Annals of Surgery.

The Veterinary Alumni Quarterly (O. S. U.)
 New York University Calendar (Weekly).
 The Philippine Journal of Science.
 Memoirs of the Department of Agriculture in India (Veterinary Series).
 Proceedings Washington State V. M. A.
 Proceedings Colorado State V. M. A.
 Announcement Kansas City Veterinary College.
 Second Report Commission on Milk Standards, U. S.
 Public Health Service.
 Annual Report Inspector of Animals, Lawrence, Mass.
 Our Dumb Animals.
 Journal of Experimental Medicine (Rockefeller Institute, New York).
 Experiment Station Record, U. S. Dept. Agr.
 Veterinary Notes.
 Expt. Station Kenort, Massachusetts.

VETERINARY LEGISLATION OF THE FUTURE OR THE DUTIES OF THE VETERINARIAN OF THE FUTURE.*

BY WALTER G. HOLLINGWORTH, D.V.S., UTICA, N. Y.

Times change and people change. The horse and cow doctor of the past, with his crude, inhumane way of treatment of animals, is a matter of history to-day. The veterinarian is becoming a more recognized factor in all progressive communities; is looked up to with pride. All this has been brought about by education. The advancement that our profession has made in the past decade is no less than phenomenal; and greater advancement will be forthcoming in the near future. Those of us that are here in the next few years will see the veterinarians in greater demand as sanitarians. They will become specialists in this branch of veterinary science. The veterinary colleges are rapidly becoming better equipped to give students a more proficient course in sanitary police work. It is hard to prophesy the changes that are going to take place in the future; but I feel that when one is brought face to face with the situation and thinks over it carefully, he can see that all that is needed is patience.

Public sentiment will demand that the health of the community is to be more closely and scientifically looked after; and this will be brought about by legislation. The legislator needs to become better educated along those lines. Something that has not occurred to him in a large majority of cases. The public press of to-day is one of the best agitators and educators. The public are eager for knowledge especially if life longevity is assured. Their slogan will be "Better Health Facilities," and

* Presented to the Central New York Veterinary Medical Association, at Syracuse, November, 1913.

that we can guarantee, if given an opportunity. When we look over some of the different branches of our sanitary laws, and the way they are carried out, it is, to my way of thinking, no less than criminal. Why do not officials set aside politics and look after the health and welfare of their constituents? I hope and trust that I may live to see the time when our state and local governments can be run on such principles. The time must come when it will be a case of the "survival of the fittest," as far as those who have positions where the life of human beings are to be considered. When meat and milk inspection is placed in the hands of those who are competent, instead of laymen, who have friends who are a power politically, the only part of whose work they can do correctly is to draw their pay, the death-rate of the human race will be infinitely small, as compared to the present loss of life due to preventable death through disease of our loved ones; of this I am positive. The trouble with a great many of the cities is that they have too many men doing one man's work. The salary of the inspector, under the present conditions, would more than pay a good compensation to a man who is proficient and properly educated, and, in a very large majority of our cities, milk and meat inspection could be looked after by him. You bring this argument before one who has the power to act—he will tell you all sorts of good things, says "yes, it must and will be done," but when the budget is made out, you will see your efforts to check death and disease has vanished. Go to see him, he will tell you that the people will not stand for the expense. Now, how ridiculous on the face of it, when we know that it is all politics. Money spent under the present law is money wasted, so far as meat and milk inspection is concerned. It costs money to run a city, but put it where the best results will be forthcoming, then the voters will not find fault. To prove what I have said is true, let the executive head of a city take the trouble to look up the statistics of that city (one that is progressive enough to employ veterinary inspectors) and see what the death record is. There are a few cities in this state that can show results obtained. Many times the state of

death has not fallen in his (that is, the city official's) household, or else he has no conscience. He hears of a case of serious illness, resulting in death, due to some diseased condition of an animal, that was transmitted to some unfortunate person. At the time he thinks of it, but soon it passes out of his mind. To him it is only one more added to that awful death record, resulting from preventable diseases that have been contracted by eating or drinking food uninspected. We have no right to play with human life. "Prevention is better than a cure." Our laws in regard to inspection are not rigid enough. The one object of a community ought to be the bettering of the health of its people. If as much attention was paid to obtaining proficient sanitary laws as is given to the subject of criminal laws, our cemeteries would not be so crowded.

I am in no position to say what percentage of death the human race is subjected to, due to improper inspection; but I am sure it would be appalling. Death records show, many persons expire, "causes unknown." Some of these cases, no doubt, are due to infected food or water, and as these two absolutely necessary articles of life come from the rural districts, that is the place to commence to enforce proper sanitary laws. And as there are so many diseases of animals that are transmissible to man, and a very large majority of them are controllable, I say, without fear of contradiction, that the qualified veterinarian of to-day is the most competent man to cope with this serious situation.

The veterinarians are not consulted often enough by our municipal officials in regard to the conditions of health. Their advice has been ignored, but, mark me, their presence is bound to be felt in the near future. To-day they are on equal footing with the physicians who have been trying to officiate in the capacity of veterinary sanitarians in many places; and how few have made good or accomplished anything in this line of work. Why? Because the physician is out of his sphere. All that is necessary is to establish proper legislation; give the veterinarian the power of the law to back up his advice on matters of sanitation, and the result would be less fat graveyards.

If our legislative chambers were filled with men, who could be free to act according to their honest belief, instead of by dictation or command, what a pleasure it would be. Then men would enter politics with energy and zeal, and valuable laws would be forthcoming. It can be done, has been done and will be done.

It is sufficient to say that from the days of antiquity, law-makers and law-givers have recognized how important it was, to keep the clean from the unclean, and throughout history we find more or less reference to sanitary legislation, which only too frequently was imperfect in the extreme, because based on miserably crude notions as to the nature and causes of disease. And right here I want to give an example of this. In years gone by, the horse doctor, as he was then called, would receive a call to see a sick horse suffering from pain. He would diagnose the case as bots, and prescribe. The first thing that he would do would be to cut a small portion of the hair of the said horse's tail off, chop it up as fine as possible, mix that with sweetened water, then pour this mixture down his throat. Now what was his theory? This sweetened mass would pass into the stomach, the bots would partake of it, then those fine pieces of hair would get into their mouths, that would cause pain, and they would stop biting the walls of the stomach. When that took place, relief came, a cure followed. I could go on and mention a great many such crude and inhumane methods. I think that matters were much worse in cattle practice; but, as I have said, thanks to education for the elimination of such vile practices and the elevation of our profession to its standard of to-day. And is it to be wondered at why the horse and cow doctor were held in such low estimation by the thinking community?

I am sorry to say that many of our municipalities are working just along these lines, no advancement accomplished. The only thing to do is to bring the powers of the law to our aid and apply the knowledge of the man of science to the end that those slack methods in vogue can be checked. When the laws are passed, then the great object will be to secure intelligent co-

operation to carry them into effect, and that can only be done by securing the services of those who are competent to act. Individual initiative; the one who can do the right thing at the right time without being told. The idea of such work is to make the public, and more especially those immediately concerned, understand that sanitary legislation is not meant to be oppressive and harassing, but is founded on the highest motives and based on the most reliable knowledge obtainable. Its object being to preserve and protect the domestic animals from disease, and to act as guardians to the public health interests, to the end that contagious diseases would be nearly unknown, or more easily and promptly suppressed.

I am looking forward to great changes in live-stock raising in the eastern states; and with the scarcity of steers in the west, which is brought about by the great ranches being utilized for agricultural purposes, it will become a profitable business for the eastern farmers to go back to the methods of our forefathers, and raise a few cattle for the market each year. In this country, in the last six years, our population has increased 29,000,000 and our live stock has decreased 150,000,000. That is a very serious proposition. Now, according to those figures we can see that we are not raising enough live stock. And it is certain that the meat cost of living will not be reduced much, as the countries that now have a surplus of stock in time will be the same as we are. They must take care of their present trade, before they can take on such a meat-hungry country as this. So I fear this importation of meat will give only temporary relief. I believe that this country is capable of producing food enough for this population. The only thing is, the producers have not managed their affairs properly. The farmer of to-day, the king of all professions, knows that farms without cattle on them are the farms that are becoming exhausted, so they are going more into stock raising, as they need the fertilizing for the farm, that is produced by the live stock. And with the increase of cattle and other live stock local abattoirs will be established, and these will need to be looked after in a sanitary way. The result will

be that a proficient state meat inspection law, similar to our federal law, would be established. One thing will lead to another. I firmly believe that our agricultural law will be so amended or a live-stock sanitary board will be established in various states, the object of which will be to look after the sanitary conditions of the rural districts.

That would necessitate the subdivision of a state into districts, and each territory would be in charge of a veterinarian who would be held responsible for its sanitary conditions; and he, of course, will be under the state veterinarian. This veterinarian should devote his whole time to this work and receive a compensation sufficient to do it. He should devote some of his time to educating the producer, being a recognized authority, so to speak, on live-stock interests. When this condition takes place as suggested, the department, which this veterinarian is employed by or is acting for, will be in close touch with the live-stock interests, and the saving to the state will be enormous. Not only to the live-stock interest, but to humanity also. Many outbreaks of contagious diseases would be nipped in the bud and checked, especially those diseases known as germ carriers. Convalescents go to the country to repair their health, and unconsciously start a chain of infection, through the milk and water. Just as happened in New York City recently. The east-side typhoid outbreak. This was traced to a farm. The patient, a typhoid convalescent, not being cautioned, was careless and infected the milk that was sent to the city from this farm, the result being many cases, and some deaths occurred. My theory would be, a case of snatching the community from the jaws of death which, under the present situation, they are striving to enter.

The trouble with the American race is that they see serious things too late. Some calamity must take place before any serious thought is given, but when that takes place, immediately something is done. If it were possible that the death of individuals could be placed at the door of the objectionable ones of the human race, we would look at this in a less serious light;

but unfortunately this is not the case. So I believe the thing to do is to lock the door before the horse is stolen. I think that the time has arrived to prevent the unnecessary loss of life, and we as veterinarians should lend our knowledge to the thinking community, to consider this serious situation, and ask themselves whether it is not time for action, to demand from the authorities that the food and water that they partake of, to sustain life, be more scientifically inspected. With the aid of the press, results will be forthcoming.

AN EXPRESSION OF APPRECIATION.—An Ohio subscriber gives the following expression of opinion of an article by our esteemed collaborator, Dr. John F. De Vine, which appeared in our December number, beginning on page 350. "I wish to heartily congratulate you for your able paper on page 350. AMERICAN VETERINARY REVIEW. I have read a great amount of veterinary literature in 25 years, but I must say yours is the best on the subject. So splendidly readable, your language so simple, plain and sensible that it holds one's attention to the last word. I must say I thank you."

FROM DR. C. D. MCMURDO, Fort Ethan Allen, we have the following items of news of army veterinarians: "I am about to leave this station and accompany my regiment to Fort Huachuca. Drs. Lusk and English will come here with the Second Cavalry. Dr. Kron sails for Manila in January to join the Seventh Cavalry, and Dr. Van Allstyne of that regiment takes his place in the Tenth. Things look very propitious for the success of the army bill next session, thanks to all our good friends who are giving us such a strong helping hand.

We sail on the "Kilpatrick" from New York to Galveston and will then go by rail to Huachuca, if we don't wind up in Mexico."

A VERMONT SUBSCRIBER, in renewing his subscription to the REVIEW, writes: "I take great pleasure in reading it every month, and look forward to its coming. I also appreciate your great effort in producing the *best* veterinary journal published."

LAMENESS OF THE HIP JOINT.*

BY DAVID W. COCHRAN, D.V.S., NEW YORK, N. Y.

The hip joint is formed by the articulation of the femur with the os innominata. It is an enarthrodial articulation, an articulation which permits the most extensive and varied movements. Every movement of the hip is the act of contraction of one or more of the muscles of the part, which, as they act on the boney levers, cause the movements of flexion, extension, abduction, adduction, rotation or circumduction. Flexion is freer than extension. Of the lateral movements, abduction is the freest, unless flexion be combined with adduction, so that one limb passes in front of the other, while circumduction is much less free in the hips than in the shoulder. It is the rapid alternations of these movements which produce the different positions and various gaits of the animal, and it is their derangement from normal conditions, no matter from what cause, which constitutes the pathology of lameness.

Lameness may be defined as any irregularity or derangement of the function of locomotion, affecting one or more extremities involving the inability of the patient (according to the extent of the injury) to sustain the body weight, due to pain from disease or injury to muscular or nervous structure, disease of synovial capsules, softening and disintegration of ligaments, ulceration of cartilage, necrosis of bone. We may classify lameness under two headings: One a swinging leg lameness, and the other a supporting leg lameness. Under the first heading will be disordered condition of muscular tissue under the second, those which support the body weight, namely hoof ailments.

* Presented to the fiftieth anniversary meeting of the American Veterinary Medical Association, at New York, September, 1913.

rupture of tendons, luxations, fractures, synovial dilatations (either thecal or bursal), nerve lesions. To summarize: In hip lameness we may have the joint proper as the seat of disease, also the ligaments, the tendons of the gluteal muscles and the muscles themselves, the bones comprising the os innominata as well as the greater and lesser trochanters of the femur.

Under this heading of swinging leg lameness we will consider sprain. In defining sprain we may say it is the wrenching of the structures which form a joint in which we have more or less laceration or stretching of muscular fibre, tendons or the sheaths surrounding or supporting them. It is probable that there is in every case of severe sprain more or less injury inflicted upon the parts in the immediate relation of the affected joint. The muscles and tendons must necessarily participate in the wrench. Ginglymoid or hinge joints suffer more than orbicular joints. Orbicular joints possess more latitude and freedom of motion. There is an essential difference in the structure of the ligaments themselves in the two classes of joints. In orbicular joints the connecting media are of a fibrous nature, comparatively thin, yielding and extensible. In the ginglymoid, the ligaments are extremely firm and indisposed to stretch, or when strained are incapable of withstanding rupture of their fibres.

The causes which are likely to result in sprain of the hip are sliding or falling on the ground surface, when the hind legs are suddenly thrown into extreme abduction or any extreme effort accompanied by a powerful contraction which may cause laceration of the soft structures, due to loss of control on the part of the animal or held in forcible operative position, either by hobbles or stocks, or due to holding back or backing up a heavy load or a misstep followed by a powerful exertion of strength in preventing a fall. This is followed by inflammation and suspension of function. Muscles are liable to wounds and lacerations, inflammation, atrophy and hypertrophy. Laceration (rupture of muscles) is often produced from slight injuries. The place where the rupture occurs is near the junction of the fleshy fibres

with their tendons. Occasionally a muscle may give way at its middle or, in fact, at almost any portion of its extent. The laceration is sometimes limited to a few fibres; at other times it involves the entire thickness of a muscle and its aponeurotic sheath. Finally cases occur in which a number of muscles are ruptured. This is, as has been stated, the result of some violent bodily exertion. Temporary lameness and inability to move about for some time are generally the only serious consequences to be apprehended until the reunion of the torn structures will be sufficiently firm to justify their accustomed use.

In inflammation of muscles the sheaths of the muscles very frequently, if not generally, participate in the morbid action. One effect of inflammation of the muscles and their fibrous envelopes is contraction of their fleshy fibres, leading to marked disorder of their function. We may have atrophy of muscles, caused by defective circulation, inactivity, or whatever has a tendency to impair the function of innervation, retard or diminish the supply of blood or induce inactivity in a muscle.

When contusion is severe, we may have a paralysis, due reflexly to injury of the articular terminal fibres of the obdurator or branches of the sacral, or directly from contusion of the sciatic as it passes behind the trochanter. The muscular spasm may be reflex, and a sufficient cause is found if we suppose the nerve terminals are injured. We have often associated with hip lameness symptoms of stifle lameness through contiguity of structure.

Wounds of tendons, when divided subcutaneously, readily unite through the intervention of plastic matter without the occurrence of any considerable degree of inflammation. There are many conditions in which not only the muscular and tendinous structures are affected by sprain, but by contiguity of parts the supplemental structures may be involved with complications, as periostitis or callouses. The true seat of pathological lesions are often uncertain, owing to the massive structure of the parts.

Under the heading of the second division I will mention luxa-

tions of the hip. I have never had any in my practice, nor have I ever seen one in the horse, although cases are on record where the accumulation of synovia was so marked that the femur would slip out of the cotyloid cavity. The diagnosis of this condition would be difficult and would only interest the pathologist and not the practitioner. It would seem almost impossible to have luxation of the coxo-femoral joint, from the way the joint is held in position by ligamentous structure.

Under the heading of fractures I beg to say that in looking over several works on human surgery I found very little mention of fracture of the pelvis, but there are volumes written on fractures of the femur; for the human pelvis is stronger, more dense and compact in proportion to its relative size than in any other animal. Accidents to the human being in the pelvis are generally the results of railroad accidents, or they have been run over by a heavy vehicle. Not so with the horse. We have more fractures of the pelvis than the femur. In the coxal region we have the union of three pairs of bones, the illeum, the ischium and the pubis, forming the whole of the pelvis. Fractures in these bones are caused by external violence and may involve the illeum, the ischium and the pubis, the cotyloid cavity or several of these parts together. The illeum is frequently injured at its antero-external angle. Sometimes a single tuberosity is broken off and remains attached to the bone; crepitation is hardly perceptible. Sometimes it is completely loose and is more or less drawn downward by the contraction of muscular tissue. There is generally no crepitation discernible, but there is a noticeable loss of symmetry in the appearance of both sides. The lameness is a peculiar one. One of the earlier symptoms is a side-way progression, due to a slight curvature of the spinal column. This, in turn, is caused by a loss of contractability of the illeo-spinalis muscle, due to the fracture of the attachments of this muscle at the angle of the illeum.

Secondly, the ischium. Fracture of the ischium is also the result of external violence, but I think most cases of this kind are the result of powerful muscular contractions. I have seen

several cases in cart horses that were compelled to back up heavy loads. There is a peculiar deformity of the croup, a flattening at the height of the ischial tuberosity, an abnormal projection on a level with the articulation of the hip. The gluteal region is larger and more prominent. The prominence is the result of a luxation forward of the posterior portion of the long vastus. While forward motion is limited, progression backward is almost impossible.

Thirdly, the pubis. We have fractures at the symphysis pubis. This is due to falls. The diagnosis is made by rectal exploration, together with manipulation of the leg by an assistant in all the varied movements of the hip to detect crepitation.

We have three other fractures which are of a more serious nature; those in the vicinity of the cotyloid cavity: one of the neck or shaft of the illeum; second, surrounding the obdurator foramen; and third, of the cotyloid cavity. When the fracture has taken place anterior to the cotyloid cavity, beside the lameness, there is a shortening of the step forward, the foot resting on the ground surface firm. If it is posterior of the cotyloid cavity, there is pain and stiffness while resting; forward motion is limited; backward motion is positively restricted. When at the cotyloid cavity, the pain is intense and lameness severe. It is generally complicated with arthritis. There is no flexion at the hip.

While I have confined myself to the pelvis, I might say that there are two fractures of the femur met with, those of the greater and lesser trochanter.

Every variety of complication, including muscular laceration, the formation of deep abscesses and injuries to the organs in the pelvic cavity, the bladder, the rectum, the uterus, may be associated with fractures of the hip. Fractures in and near the cotyloid cavity may cause disability of the patient, as when the reparative process has left boney deposits in the pelvic cavity at the seat of union, which may induce local paralysis by pressure on the nerves that govern the muscles of the hind leg. This is a condition which is seen when callouses have been formed at

the floor of the pelvis near the obturator foramen, pressing upon the course or involving the obturator nerve.

Treatment: In cases of sprain the treatment will depend on the severity of the case. Hot-water applications and hot packs, stimulating liniments, vesicants, setons, the actual cautery, either superficial cautery or subcutaneous cautery, inter-muscular injections of normal salt solution, tincture of iodine, spirits of turpentine. For fractures, place the animal in slings to prevent motion as far as possible.

MULE BREAKS VETERINARIAN'S ARM.—Dr. A. O. Kennedy, Columbia, Tennessee, recently sustained a fracture of the left radius from the kick of a mule. We are glad to be able to report Dr. Kennedy now convalescent.

SCRATCH, DOCTOR GOT IN WORK, PROVES FATAL.—Fort Smith, Ark., October 17: Dr. H. A. Fry, Assistant State Veterinarian, and widely known throughout Arkansas, died Tuesday from blood poison, the result of a scratch sustained a week ago while operating on a horse.—(Clipped from *Arkansas daily*.)

THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY will hold its annual meeting at the Hotel Windsor, Trenton, N. J., on Thursday, January 8, 1914. Secretary Loblein extends the usual cordial invitation to the many friends of the organization in the neighboring States.

ENTERS THE REALM OF GENERAL PRACTICE.—Dr. H. O. Moore, of Westfield, Indiana, has become associated with Dr. Edgar Heiny, Hattiesville, Miss., in general practice. We congratulate Dr. Moore in having embraced the practice of veterinary medicine, which holds so much of interest for those engaged in it, and congratulate Dr. Heiny in having Dr. Moore associated with him.

PROMINENT VETERINARIAN BECOMES SECRETARY OF CATTLEMEN'S ASSOCIATION.—Dr. Tait Butler, editor of the *Progressive Farmer*, an active worker in the A. V. M. A., and known to veterinarians all over the United States, was elected secretary of the Southern Cattlemen's Association, at their recent meeting in Memphis, Tenn.

REPORTS OF CASES.

AN OUTBREAK OF TUBERCULOSIS IN PIGEONS.*

By F. S. JONES, New York City.

In the early part of June a live pigeon was brought to the laboratory for diagnosis. The owner stated that the bird with some others was suffering with nodules on the wing, which he thought might be cancers.

The bird was a female, five or six years old, of a fancy breed and had been ill some time. Depression was not noted. The eyes were bright, and emaciation was not apparent. The appetite was good. At the humeral radial articulations of both wings and on the tarsal joints of the legs were large irregular swellings.

The pigeon was chloroformed and a careful post-mortem examination made. The following facts were noted at that time: The bird is in good flesh.

At the humeral radial joint there is a large, irregular, lobulated swelling, involving both the external and internal aspect. It measures 4.5 cm. long by 3.5 cm. wide by 2.5 cm. thick. The external surface is perforated by a large opening 2 cm. in diameter. Protruding from this is a plug of caseous material. There is a smaller opening on the external aspect. On cutting into the nodule it is found to be made of yellowish-white caseous material, having a disagreeable odor. The lesion not only involves the subcutaneous tissue, but the tissue surrounding the joints and the bones. The right wing and both tarsal joints of the legs are affected, the pathological processes have not advanced as far as those in the wings.

The heart, liver, spleen, lungs, kidneys and ovaries are apparently normal. There are two small, round, yellowish-white tubercles in the pancreas. Over the serosas of the intestines are

* This observation was made in the laboratory of the Department of Comparative Pathology and Bacteriology of the New York State Veterinary College, at Cornell University, Ithaca, N. Y.

scattered a few small round nodules. One large irregular, yellow nodule is present in the mesentery.

Properly stained smears made from the caseous material of the wing and mesentery revealed the presence of large numbers of "*Bact. tuberculosis*." The organisms were long, slender and beaded.

At the request of the writer two other pigeons were brought to the laboratory. They were chloroformed and examined.

Number 2. A female between three and four years old. The bird is in good flesh, depression not noted. On the right wing at the carpal joint is round, raised swelling, fifteen millimetres in diameter. The inner surface is perforated with a large round opening, plugged with necrotic tissue covered with a thick scab. The body of the nodule is made up of yellow caseous material. The bones are not involved.

Careful examination of the other joints and the internal organs fails to show that they are affected. "*Bact. tuberculosis*" demonstrated in smears from caseous material.

Number 3. Male between five and six years of age. The bird is emaciated. Weakness is marked, respirations somewhat difficult, but the appetite is good.

Right wing: At the humeral radial joint is one small nodule three millimeters in diameter. Beginning at the lower end of the ulna and involving the carpal joint, and extending to the lower ends of the large and small metacarpals, are a series of confluent tubercles. The whole mass is 4 cm. long by 2 cm. wide and varies in thickness from 1 to 1.5 cm. On the surface are three small openings plugged with caseous material.

The lower end of the humerus is badly necrosed. Caseous material has replaced the bone. On the ulno-radial articulation there is an irregular tubercle having a diameter of 6 mm. and a depth of 4 mm. The bone marrow is necrotic.

The posterior half of the right lung contains one large round yellowish-white tubercle. The nodule measures 1 cm. in diameter. It is composed of yellow caseous material surrounded by a fibrous capsule.

Smears from the necrotic material of the wings and lung, when stained for tubercle, revealed the presence of the specific organisms in large numbers.

Tubercles were not found in any of the other organs. Inoculations from the caseous material upon glycerine agar were incubated at 37.5 degrees C. for 30 days. At the end of that time tiny round greyish white colonies were visible. Smears were

made from these and stained in hot carbol fuchsin, and treated with acidulated alcohol, failed to discolorize the organisms.*

Pieces of the various pathological tissues were fixed in Zenker's and sectioned.



Fig. 1.



Fig. 3.



Fig. 2

Figure 1. Tubercles on wing of pigeon No. 1 x 1.

Figure 2. Tubercles on leg of pigeon No. 1 x 1.

Figure 3. "Bact. Tuberculosis" in smear from lung of pigeon No. 3 x 750.

The microscopic lesion is typical of avian tubercle. The nodule consists of a necrotic centre surrounded by a row of giant

* In the 28th Annual Report of the Bureau of Animal Industry, U. S. Department of Agriculture, 1911, pages 64-65, a "lumpy" or nodular disease of pigeons is briefly described. The malady is apparently characterized by the formation of subcutaneous caseous nodules involving the heads, necks and wings of pigeons. The etiological agent seems to be a rod-shaped organism having some resemblance to "Bact. tuberculosis." It resists decolorization with mineral acids, but is decolorized by acidulated alcohol.

cells. Surrounding the giant cells is a thin connective tissue capsule containing epithelioid cells. The outermost layer is comprised of lymphoid cells and polymorphonuclear leucocytes. The lesion in the wing is made up of a large caseous deposit in the subcutaneous tissue. The skin is generally normal, except where the processes have extended directly through it, causing a perforation. The lesion in the intestine involves principally the serous and muscular layers.

In properly stained preparations the causative organism is found to be in the necrotic material in large numbers.

The owner was advised of our findings and informed us that within the last six months nine cases of the disease had appeared. Three birds became badly affected at various times during the winter. As soon as a case was noted it was isolated. The disease progressed slowly in all three birds, but finally the whole side became involved, and it was decided to chloroform them. Up to this time six other birds have become affected. Three of them are well advanced, but the others have developed recently. All of the birds revealed the nodules on the wings.

A clear record of how the disease gained entrance into the flock is lacking. A large number of birds are exhibited at the various poultry shows every year. Less than two years ago a pair of highly bred birds were purchased for breeding purposes. Several months after their introduction the female died of some unknown disease. The owner was inclined to believe that this bird brought tuberculosis into the flock.

The owner was advised to slaughter all pigeons showing nodules on the wings or any birds that were emaciated. The birds were valuable, and he was desirous of perpetuating the various strains. It was suggested that the house be divided and separate yards constructed. One part to be used only for young stock hatched from the eggs of selected individuals and the other side used for regular flock. Thorough disinfection of the houses and coops and the liming of the yards were urged. The suggestion was made that he mate the birds as usual. As soon as the eggs were laid, they were to be removed from the mother and dipped in alcohol and incubated under a common pigeon obtained from a healthy flock and reared in the other side of the coop. In this way it is hoped that a flock of sound birds may be raised, and the original birds in which the disease is known to exist, may be disposed of.

LYMPHO-SARCOMA IN THE DOG.

By A. SLAWSON, D.V.M., New York, N. Y.

This paper presents in full a single case of lympho-sarcoma in the dog and is not a treatise on this disease, as the title might imply. However, a few general remarks on the subject may not be out of place, in bringing to your notice the case in question.

Lympho-sarcomata are claimed by many to be found only on the external, visible, genital organs, viz., on the vaginal walls, vulva and perineum of the bitch and on the mucous membrane of the prepuce and penis of the dog, especially at the base of the penis. They are infectious, being transmitted from one sex to the other during the act of coition. While some investigators were at first inclined to pronounce these growths lesions of a venereal disease, similar to those of syphilis in man, no spirochaete has been demonstrated. The general appearance of the external forms of this cancer is granulomatous, varying in size from a pinhead to a hazelnut and larger. There may be one granuloma or several, which, as they enlarge, may become confluent, forming a spreading growth. The larger growths are often spongy in consistency and bleed easily. It is probable, owing to the friable nature of the external forms of these lympho-sarcomata, that they are transmitted because of the physical strain to which the genital organs of canines are subjected during copulation. On this account it would seem that these cancers are infectious in a pathological and not in a bacteriological sense. Since they follow the usual course of malignant growths in being metastatic, it is justifiable to believe that metastasis occurs during sexual intercourse, when the organs of copulation being engorged with blood and under considerable pressure, conditions are favorable for such transmission.

In the case now to be described it is interesting and important to note that lympho-sarcomata may exist internally quite independently of any external manifestation of the disease and in animals where sexual intercourse has not taken place.

History: The patient, a Maltese terrier dog, one year old, had been ailing about four weeks. He began losing weight, grew perceptibly weaker, urinated infrequently—the urine having a very yellow color and strong odor—and occasionally passed a little blood with the stools. He had not at any time been used for stud purposes. His appetite was fair throughout his illness.

Symptoms: Pulse 110. Temperature 101. Great prostration. Rectal examination revealed large mass near right kidney.

Catheterization yielded little urine, but showed the urethra to be unobstructed. The mucous membrane of the prepuce and penis were normal. Palpation of the abdominal walls revealed a firm mass in the abdominal cavity.

Diagnosis: The tumor was pronounced a malignant growth, which involved the right kidney and possibly the bladder. The prognosis was given as unfavorable.

Treatment: With the owner's consent an exploratory operation was decided on, but it was agreed, if the case proved hopeless, that the dog should not be allowed to come out of the anesthetic.

After the usual surgical precautions had been carried out a laparotomy was performed. Through the abdominal opening a large growth was seen that involved the kidneys and was adherent to the mesentery which was also affected. The growth being inoperable, the dog was not permitted to recover from the anesthetic.

Autopsy: The left kidney was cystic, the capsule and part of the cortex only remaining, the medulla having been destroyed. The parenchyma of the right kidney, although abnormal in appearance on cut surface, proved normal on microscopical examination. The growth, beginning in the pelvis of the right kidney, involved also the left kidney, and adhered to the mesentery, whose lymph glands were enlarged. The entire growth being about four inches long, three inches wide and two inches thick, had a nodular appearance. Microscopical examination of the tumor showed it to be a lympho-sarcoma, the diagnosis being made by Dr. Jas. Ewing, of the Cornell Medical College. The sub-lumbar, sub-sacral, bronchial and inferior cervical lymph glands were enlarged.

Conclusions: The foregoing case shows that lympho-sarcomata may occur independently of any lesions of the external genital organs and without the act of copulation having been performed. In Dr. Ewing's opinion, lympho-sarcomata may occur as primary growths, not necessarily involving the external genital organs. They have been found in the skin and there is a specimen in the museum of the Cornell Medical College of lympho-sarcoma of the walls of a dog's uterus, which resembles in its external nodular appearance the growth now before you.* Beebe and Ewing, in 1908, published a paper of their work on this disease. They found it transmissible by coitus

* Preserved specimen shown.

and on transplantation metastatic growths appeared. Pieces of the tumor from this case were transplanted into other dogs, with negative results. It is probable, according to Dr. Beebe, that the tumor was too far advanced, the best results being obtained in the earlier stages of these growths.

RIGID OS UTERI IN A COW.

By S. J. ALCALAY, D.V.M., Cottonwood, Minn.

Dear Editor—I consider the REVIEW as a meeting place where the savant and the beginner, the professor and the student meet together, the former to instruct and guide and the latter to question or discuss. Or, as the French saying goes, "*Et du choc des idées jaillit la lumière*" (a spark comes out from concussion of ideas).

The case I want to submit to the profession through the columns of the REVIEW is as follows:

Quite a progressive farmer came to town Sunday and said: "My cow has been calving for awhile and I fail to see her expulse her calf. I wish you to come and try your ability." I went and on exploration I found that the os uteri was so much contracted that hardly the first and the second fingers could penetrate through. I explained the farmer what we were up against (just to follow Dr. John McNeil's advice, "Always explain the farmer—and in the presence of a third party—what there is to do.") The cow was strong and young and by palpation I located the head, and over it made an incision. After this I made an opening for the full hand, straightened up the legs which fortunately were the front ones. I tried to keep cool and directed my hand so gently as to cause the least injury to the mother and the little one. After manipulation I brought limbs and head to a normal presentation. After a short traction we had the little fellow out, to the greatest happy surprise of the farmer and not with a small satisfaction to the operator who had been working for over two hours. But the cow made it disagreeable enough, as at every five minutes she would evacuate feces over the operator's arms. This would necessitate the cleansing of the genital overtures oftener. This was done with a smile, as losing patience in a critical case, such as this, would mean a loss

to the farmer, and the principle of the writer has been to always be honest in the work and sincere in talk.

The farmer was so pleased that he thanked me very much for the work and was very willing to advertise it in the local paper, and this from his own will.

Undoubtedly many a brother veterinarian has had cases like this. What I want to emphasize is the good results obtained by keeping cool; the success of the operation and also the great resistance of a cow for such an operation. I am glad to report that the cow and the youngster are doing very nicely, it being the fifth day at this writing.

AZOTURIA CASE IN RAIN.

By JOS. J. SMITH, D.V.S., Beaverton, Oregon.

Had a case of azoturia on the road, in a rainstorm. Treated with stimulants, and externally plenty of hot water and blankets, and managed to keep the horse on his feet. He was able to walk home in the morning.

I treat a great many azoturia cases on this line of treatment, and do not lose many. When they get down it sometimes takes two or three days of treatment and careful nursing before they get up.

AN ANTHRAX OUTBREAK—VACCINATION DOUBLE METHOD.

By GROVER V. LOVE, M.D.V., Chalmers, Indiana.

On September 19 last I was called to a large cattle ranch to see a herd of 70 two and three-year-old steers that were dying without showing any symptoms of sickness, according to the owner and attendants. I found the cattle grazing on very low, swampy land. The owner informed me that in former years he had suffered heavy losses in the same pasture from symptomatic anthrax or blackleg, but as these cattle had been recently vaccinated for blackleg, he was at sea to know what could be wrong. After careful post mortems, also microscopical examination of tissues and blood, and guinea-pig tests, a diagnosis of malignant anthrax was made.

The herd was quarantined at once, and I began vaccinating with the double method of anthrax vaccine. The loss before vaccination was eighteen steers and two horses; the loss after vaccination was two steers and no horses.

I state the above because as far as I can find out this is the first outbreak of this disease in Indiana. If this is not the first in this state, I would like to know when and where the others occurred.

The diseased herd are doing nicely at present. I have vaccinated 300 head in the infected district lately with no loss.



GLANDERS.

The above picture shows twenty-eight head of horses destroyed, with glanders, at Eden Valley Ranch, Hearst, Mendocino County, California, by Deputy State Veterinarian Dr. A. Asbill, of Sacramento, and Dr. H. Bergh, of Suisun, California; the latter acting as veterinarian to the owner of the horses. It is a sad picture, but there is but one thing to do with a glandered horse; just what the California veterinarians have done with these.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

PARALYSIS OF THE INTERNAL POPLITEAL NERVE IN CATTLE [*R. H. Smith, M.R.C.V.S.*].—Frequently observed by the author in dairy cows, more frequently subsequent to parturition.

While standing, the animal can place little or no weight on the leg and the digits are held in a state of plantar flexion. Hock cannot be extended, but with each forward step it is over-extended, so that the foot is jerked upwards and forwards with the digits flexed backwards and the anterior surface of the fetlock finally comes to the ground. Recovery takes place spontaneously in about 75 per cent. of the cases. In other cases the animal lies from one to several weeks and when rising shows great muscular atrophy of the thigh. There seems to be no pain. Animal loses flesh rapidly. Treatment has seemed to be of no avail. The cause of the trouble is obscure, perhaps deficient blood supply from embolism.—(*Vet. Journ.*)

INTUSSUSCEPTION IN A BULLOCK [*W. D. Lindsay, M.R.C.V.S.*].—Yearling bullock in thriving condition was disinclined to eat and has tympany of the rumen.

Laxative treatment gives no result.

The animal was kept for three days and finally slaughtered. At the post mortem a very interesting intussusception was discovered. It measured 11 inches in length.—(*Ibid.*)

PARASITIC CYST IN THE BRAIN OF A HEIFER [*H. A. Reid, F.R.C.V.S.-D.V.H.*].—Six months previously the animal was noticed to present certain abnormal symptoms, more or less erratic movements, tendency to incline the head to one side. No real definite cause was made out. Later the manifestations grew more marked. Heifer walked in circles, eyesight defective, loss of condition. No bulging or softening of the cranial bones was present. No pain on pressure over the region. Cystic brain

growth was diagnosed and the post mortem revealed a hydatid cyst occupying the right lateral ventricle, with its wall composed of greyish white fibrous tissue and studded with yellow granular material. The cyst was about the size of a goose egg.—(*Ibid.*)

WASP STING [*T. G. Palgrave, M.R.C.V.S.*].—Large female tabby cat was stung by a wasp. When stung she behaved as though in a fit, rushing about wildly, running round, mewing and finally collapsed. She breathes hurriedly and irregularly. pulse is rapid almost imperceptible, pupils greatly dilated, muscular twitchings all over, animal in pain, cries pitifully but faintly. Chloral was given to allay pain and followed by aromatic spirit of ammonia. This had a good effect, which lasted for an hour or so when she was taken with a new set of symptoms.

Apparently no pain, respiration slow and deep, weak hind-quarters, loss of control of hind muscles, cold body and limbs, pupils less dilated, pulse fuller and regular, temperature 99.8 degrees Fahrenheit. She staggered about the room. Inhalation of medicinal liq. ammonia, French brandy. She slept then and gradually recovered.—(*Ibid.*)

POISONING BY BARIUM NITRATE [*W. J. Moody, F.R.C.V.S.*].—Valuable thoroughbred mare had a cough for which was prescribed 30 grams each of the powder of chlorate of potash, nitrate of potash and glycyrrhiza. She had two powders six hours apart, and was taken with violent colics and died before the arrival of the writer. Post mortem showed stomach quite normal, also first part of the duodenum, but small intestine is more or less in a venous congestion. One of the powders was the next day given to a colt. He had diarrhea for a week after. The prescription was then made up by another druggist and the new powders given to another colt with good results. The powders made up by the first druggist were analysed and found to contain 30 grams of nitrate of barium instead of the potassium. The analyses of the contents of the intestines of the mare revealed the presence of considerable quantities of barium. Suit for damages was the conclusion of the case.—(*Vet. Record.*)

AMPUTATION OF THE LIMB IN A COW [*Peter Meikle, M.R.C.V.S.*].—Ayrshire, grey, aged two years was found one morning with fracture of the off fore canon bone. The cow was operated on, the leg being put in splints with dry dressing until wound healed. Then about six weeks after an artificial limb was applied, consisting of two iron splints attached to a round piece

of wood below, and to the limb below the elbow by a broad band of leather which was laced tightly. The stump of the leg was inserted into a leather pocket resting on a felt pad. The cow uses her leg well, lies down and rises and can run with the rest of the cattle.—(*Vet. Rec.*)

ANTHRAX IN A HORSE [*Wm. J. Moody, F.R.C.V.S.*].—Grey mare, half bred, five years old, has been in good condition and worked well since purchased. One morning she was taken very ill with pains similar to colic. When the author arrived she had died. On opening the cadaver there was found a great amount of fluid in the abdominal and pleural cavities. The intestines were in an infiltrated condition, like one finds in the muscles of charbon symptomatic. Anthrax was suspected and confirmed by microscopic examination. There are no sanitary laws of Board of Agriculture or County Councils in Chili.

The sequel of this case was that the man who skinned the carcass got inoculated and had to have his arm amputated to save his life. The writer himself, nine days after, had pustules developed on his right wrist and arm and had to be freely cauterized with thermo and received injection of tincture of iodine at the rate of 40 a day. Good recovery was obtained only after three weeks of treatment.—(*Vet. Record.*)

ANEURISM IN A HIMALAYAN BEAR [*H. G. Ganouly, Bengal Vet. College*].—A young bear was presented to the college. He soon became quite tame and ran about.

He appeared comfortable and happy although was observed having fits and vomiting on occasion. After a while he died suddenly without having shown any immediate symptoms of ill health. At the autopsy the abdominal viscera were found very anaemic. In the thorax there were two bloody effusions and a large blackish clot of blood measuring 7 by 3 inches, and situated between the left lung and the costal wall. When this was removed two aneurisms of different forms and sizes were exposed. One, the largest, had ruptured and caused the escape of blood in the thorax. The lungs were collapsed and free from lesions. There was no parasitic infection of the internal tunic of the aortic arch, but degeneration and atheromatous condition. The heart was to all appearance healthy.—(*Journ. Comp. Pathol. & Therap.*)

GLANDERS IN MAN [*S. H. Gaiger, M.R.C.V.S.*].—Cases of this contagion are fortunately rather rare, and yet they occur

too often. The author has been the victim of the fearful disease and fortunately has escaped the usual termination. Infected in March, 1911, he passed through a horrid period of sufferings and of operations which did not end until June, 1913, when at the time of writing he felt that he had never been in better general health and believed he had made a complete recovery. Abscesses after abscesses, lymphatic troubles, incision of rebel fistulous tracts, removal of phalanges, amputation of one arm, a temporary loss of one ankle joint, which, without counting the smallest of the incisions, required forty-five surgical interferences, and of those twenty-seven under a general anesthetic tell of the various manifestations of the infestation and of the many complications following it. The treatments that were followed have varied of course with the condition and location of the lesions, poultices, hot applications, morphia as indicated, antiseptic applications, belladonna, boracic acid, vaccination, iodoform, peroxide of hydrogen, cyanide, iodine tincture, etc. During the whole disease, the temperature offered various records, reaching one day as high as 104 degrees Fahrenheit. Many cultures, inoculations and microscopic examinations had left no doubt as to the correctness of the diagnosis.

Written by the sufferer with all the minutiae of a scientific observer, the article is very instructive and sadly interesting.—(*Journ. of Compar. Pathol. & Therap.*)

FRENCH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

PULMONARY COLLAPBUS WITH CALCIFICATION IN A CALF [*Martel*.]—A round mass as big as a child's head was found by a slaughtering boy in the abdominal cavity of a calf which he was dressing at the abattoir.

The mass was very hard, enveloped by a thick fibrous envelope and inside presented a certain number of fibrous bands, surrounding spaces invaded with calcareous deposits and forming a characteristic lobulation. At the histological examination the envelope of the tumor was formed of connective cells and numerous elastic fibres resembling the arrangement of the pleura. The interior was formed by numerous cavities more or less ramified, with epithelium like that of the bronchia. Between these there existed slits of various disposition, as if there had

been squeezed alveoli, as in collapsed lungs. Calcification was spread all over, but there were no bony bands.

Was that mass a pulmonary lobe which had passed through the diaphragm, presented all the characters of collapsus with chronic peribronchitis, then return to the condition of bronchial cells with diffuse calcification? The mass becoming then pedunculated and left free in the abdominal cavity.—(*Sanit. Report.*)

PHARYNGITIS—SUPPURATION OF THE MIDDLE CERVICAL LYMPH GLANDS—ULCERATIONS IN THE TRACHEA [*Mr. Janin and Fosse, Army Veterinarians*].—A nine-year-old bay horse is taken with pharyngitis and treated in the usual way. But the diseased manifestations seem to hang on him and the horse remains with marked dysphagia, dry and intermittent cough, mucous nasal discharge. One morning there is a diffuse swelling of the thyroid region. It is painless and not fluctuating. Exploring punctures are made. The swelling increases some but no suppuration is detected. The temperature has raised to 39 degrees C. Yet the animal appears lively, eats a little and does not seem inconvenienced by the peritracheal swelling. One morning he is unexpectedly found dead. At the post mortem the important lesions were in the pharyngeal and tracheal region, where a purulent collection elongated, ovoid, as big as an apple was found between the trachea and the muscle longus colli and extending from the 3d to the 8th tracheal ring.

It had ulcerated and by two openings emptied itself into the trachea, causing a fatal intoxication.—(*Journ. de Zootech.*)

HYPOSULPHIDE OF SODA IN DOG DISTEMPER [*Mr. Teppaz*].—The author first treated cases with intestinal form. The effect was so wonderful that he decided to use the same drug in a systematic manner for all cases, no matter what was the form, intestinal or pulmonary, and without the use of any other drug. In the beginning of the disease he gave first a purge of calomel and afterwards in milk or sugared water hyposulphide 0.6 to 1 gram, divided in 10 doses. One being given every day after the purge. Revulsion of the chest is also indicated when respiratory symptoms are present. Under that treatment the diarrhea of the gastro-intestinal form is soon subdued. The cough and expectoration of the respiratory trait diminish. The treatment can be renewed if necessary. For the author the treatment is to be recommended as having given him always very satisfactory results.—(*Rev. Gen. de Med. Vet.*)

SUB-ACUTE DIFFUSED MENINGO-ENCEPHALITIS IN A DOG [MM. Royunet et Sellier].—"If this affection in man seems to be a sequela of syphilis, in dogs it looks as if it followed distemper." This remark of Prof. Petit and Dr. Marchand is confirmed by the following case. Black cuniche has had distemper when 9 or 10 months old. A year and a half after he had a cutaneous vesiculo-papulous eruption and a gastro-enteritis. Since, he loses flesh gradually, he has paresia of the hind quarters, inco-ordination of movements, walks staggering with giving away of the legs. With the paraplegia, he begins to check his head, has dysphagia by paralysis of the tongue and lips. He loses his voice.

Notwithstanding strychnia, electricity, points of cauterization, the medullary paralysis progresses, the forelegs are affected. There are convulsions, strabismus, contractions of the eyelids, grinding of the teeth, hallucinations and finally death takes place about one year after the apparition of the first symptoms. Death occurred in coma.

At the autopsy and at the histological examination lesions characteristic of sub-acute diffused meningo-encephalitis were found.—(*Journ. de Zootech.*)

PECULIAR CASE OF CEREBRAL TUBERCULOSIS IN A STEER [Mr. A. Rieussec].—Five-year-old steer is taken suddenly with violent excitement—is absolutely furious, jumps here and there in his stall, tries to get up in his manger, he moans loudly, strikes with his horns on surrounding objects. These accesses of vertigo are followed with moments of quietness of short duration. Muscular twitchings take place on the shoulder and thigh. The general sensibility is abolished and the animal does not resent punishment of any kind. Full bleeding, mustard frictions, purgation, give some relief, and the animal is in a deep state of quietness. The next day a convulsive movement of the jaws is present, resembling those of rumination, but more rapid. Then appear troubles of motion. The digestive apparatus is involved, prehension of food is impossible, and deglutition slow. Death takes place on the fifth day. Post mortem examination revealed lesions of generalized thoracia and abdominal tuberculosis and one tuberculous mass in the right cerebral hemisphere and several small ones on the false cerebri. The tubercles were yellow and caseous.—(*Revue Veter.*)

DIVERTICULUM OF FLOATING COLON CAUSES FATAL OBSTRUCTION IN A HORSE [MM. Moulis and Salmare].—Eight-

year-old gelding has colic; not severe. Treated with eserine, pilocarpine, etc., he remains the same for two days, although he has passed no feces. Arecoline is given, also castor oil without result. The horse is no better, lays carefully down, sits on his haunches, as dogs do. As no improvement appears, the owner decides to send him to the butcher. At the dressing of the carcass, on opening the abdomen a strangulation of the small colon is discovered. It was due to a diverticulum, finger glove in shape, situated near the end of the colon. It was continued with the intestine by a small cord, ten centimeters long, which had formed a loop around the colon, which had then become a complete obstacle to the exit of the feces. Rectal examination had not been made, and, if it had, probably the nature of the trouble might have been detected, although relief could not have been given.—(*Rev. Vet.*)

APPENDIX AND APPENDICITIS IN A SMALL MULE [*Mr. Belille-Betat*].—Forty-eight hours old, he has had colic for twelve hours. He was born at term, was well the first day. He died a few minutes after the author arrived.

No lesions to explain the colic were found except marked congestion of the cæcum. At the point of this organ there is a cylindrical appendix, rounded at its end, slightly curved and having the size and form of the index. It is a simple diverticulum of the cæcum, with which it corresponds and its cavity is filled with reddish, putty-like meconium. It is evident that the little fellow died with appendicitis.—(*Ibid*).

POLYCYSTIC AFFECTION OF THE LIVER IN A BOVINE [*Mr. L. Cauchemez*].—These lesions were found at the abattoir when the animal was slaughtered. His liver weighed 40 kilograms (about 80 pounds). Its surface was extremely bosselated and presented in its thickness a very large number of cysts of various sizes from the head of a pin to that of a foetal head. They were not cysts of echinococci, but were monolocular containing fluid, whitish or rosy or dark brown. There were no indications of degenerated parasite. It was a simple polycystic affection of the liver, whose structure showed a marked sclerosis all through the organ.—(*Hygien. de la Viande et du Lait*).

GROWS BETTER ALL THE TIME.—An Ohio subscriber, in renewing his subscription writes: "Every number of this valuable journal grows better, and I would not like to be without it in my practice."

CORRESPONDENCE.

ANIMAL INDUSTRY—AN UP-TO-DATE DEPARTMENT.

THE VETERINARY ASSOCIATION OF NEW SOUTH WALES.

SYDNEY, October 18, 1913.

The Editor AMERICAN VETERINARY REVIEW:

DEAR SIR—It occurred to me that the enclosed article from the *Daily Telegraph*, one of the leading daily papers of this city, might be of interest. It shows how the good work of veterinarians in one part of the world assists their brother professionals elsewhere by acting as a model to which attention can be drawn.

Yours faithfully,

MAX HENRY, M.R.C.V.S., B.V.S., Hon. Sec.

A MODEL FOR AUSTRALIA.

In a recent number of the AMERICAN VETERINARY REVIEW a writer refers to what he terms the National Veterinary Department of the U. S. A. By this he means the department which is officially styled the Bureau of Animal Industry, and which, under that name, has gained such a world-wide reputation for the efficiency of its administration and the brilliancy of many of the investigations carried out under its supervision. In the United States of America the Federal Department of Agriculture is divided into a number of bureaus, the chief of which are, in all but name and the major questions of policy, the heads of independent departments. Of these bureaus, that of animal industry is probably the best known, and all matters dealing with live stock are considered as coming within its scope, whether they be the breeding and management of stock generally, the investigation and control of disease, the quarantine of introduced stock, the inspection of meat, or the purity of milk. It shows in probably its highest development the practical application of the truth that it is undesirable to separate the State's work amongst healthy stock from the State's work amongst dis-

eased stock, as the two must obviously so often overlap, and where two equal authorities overlap confusion results.

The aspect of the bureau's activities which has come most forcibly before our notice recently is its work in the eradication of the cattle tick and tick fever, to study which a Royal Commission was recently sent from this country. In the last annual report of the bureau, received here, the release of thousands of square miles from quarantine is notified, that is to say, the bureau is of the opinion that ticks have been eradicated from those areas. The report generally shows that the brilliant band of veterinarians who control the board have carried out equally good work in other directions. In meat inspection the Federal department deals only, as in Australia, with meat for export, and this inspection was practically forced on the United States Government by the outcry following the revelations of the conditions of the great slaughter-houses, just as the Australian Government was practically forced by the outcry in connection with worm nodules and the demands of oversea countries for efficient inspection to put into force our present more or less complete system. Along with the examination of meat are carried out investigations into the various diseased conditions met with, and also into coloring matters, preservatives, etc., used in the preparation of meat food products. It is not sufficiently recognized in Australia that the installation of a really efficient system of meat inspection pays handsomely as an advertisement.

Amongst the diseases of stock into which extensive investigations are recorded during the year under review, are Malta fever in goats, "measles" in beef, swine fever, the ever-interesting tuberculosis in cattle, the prevention of tetanus, which causes a constant mortality amongst horses in the central-western districts of this State, and chronic bacterial dysentery of cattle, which is suspected of having been introduced into Australia. In other ways, such as the carrying out of breeding, experiments in various classes of stock, the bacterial contents of milk, and the effect of various forms of feed on the milk of cows, the bureau is evidently carrying out able work.

In looking at such an institution as the United States bureau, we must take into consideration the men who have made it and control it, to understand exactly why it occupies the position it does in the agricultural life of the country. The present chief of the bureau, as he is called, is a veterinarian of high standing as an administrator, Dr. Melvin, and it is largely owing to his work and that of another distinguished veterinarian, Dr. Salmon,

that the B. A. I. holds its present proud position. Associated with him in the disease section of his work are two veterinarians distinguished as pathologist and experimenters—Dr. Mohler, in charge of the pathological division, and Dr. Schroeder, in charge of the experiment station. Many of the names of other members of the staff are world-known amongst the scientific men of other countries, and although it will, of course, take some time before the staff of what is to be the Australian Bureau of Animal Industry can make its mark, we are sure that it only requires a little liberality in the way of salaries and a wise choice on the part of those responsible for making the appointments for the Commonwealth Government to obtain men who will leave names behind them equal to those of their American confrères.

There can be no doubt that in forming the proposed branch of the Federal Agricultural Bureau to deal with live stock the authorities might do worse than note the manner in which the Americans have built up and maintained this splendid department, since the conditions here are not unlike those in the United States. The scope of possible investigations by a strong Federal Veterinary Department is enormous in this State alone, and such widely spread affections as the western or melon blindness of horses would deserve considerable attention. Moreover, a Federal department could grapple especially well with the tick question, since its sphere of action would not stop at the border of any State, and much loss could be saved to New South Wales, were the question of pleuro-pneumonia in cattle made a Federal one, for the same reason.

BROOKLYN, N. Y., November 20, 1913.

Editors AMERICAN VETERINARY REVIEW, New York City:

GENTLEMEN—In the November issue of the REVIEW nine pages are occupied with the "Report of the Special Committee for the Detection of Glanders."

The chemical analysis of the various agents used in diagnosing glanders is comparatively unimportant to the busy practitioner. It is universally admitted in the veterinary profession that mallein is a perfectly reliable diagnostic agent in this disease. In the past sixteen years I have found it an infallible test.

Until the chemical analysis was disclosed in the article under

discussion I was not aware of its composition. I knew the unfailing results of its use as a test agent. My point is this: To the average busy veterinarian the chemical composition of these tests is not the important factor; it is the knowledge by competent practitioners that they *do* show the presence of glanders.

I cannot understand why the efforts of this committee should be limited to the "reduction" of glanders when it is known to the profession that the immediate destruction of the affected animal is the *ONLY* effective method of successfully stamping out this scourge.

There can be no "best method for the reduction of glanders." It must be bodily removed beyond the possibility of disseminating contagion, for while one horse walks our streets exhaling the germs of this disease, every animal in contact is highly liable to infection.

Why give space to "reduction"? An impossibility! It must be *stamped out*. And the stamping out must, to be effective, be accomplished on the spot where the case is found; not traveled the distance to the offal dock, as has been frequently done in Brooklyn; and the premises, harness, blankets, etc., etc., must be properly fumigated and disinfected.

If the prevailing methods of the Board of Health were suited to the crying needs of the day, why should the necessity exist for the destruction of eighteen horses in one stable and ten in another, as was recently the case? Why was not the *first* case discovered and dealt with summarily, thus saving great financial loss?

The department is well paid for periodic visits to all stables, for the very purpose of testing for glanders in its *latent* period. Were this mode of dealing with the disease successfully carried out, glanders would not to-day be on the increase, and the efforts of the department would not show the ignominious failure attending the handling of this disease, now evident.

Yours very truly,

L. McLEAN, M.R.C.V.S.

THE HIGH CLASS OF THE REVIEW APPRECIATED IN MICHIGAN.—In renewing his subscription, Dr. H. Haynes writes: "Please accept thanks for the *class* of the REVIEW during the past year, and our good wishes that success may crown your efforts in the future."

ARMY VETERINARY DEPARTMENT.

DEATH OF A FRIEND OF OURS.

Dr. Franz Hell, veterinary general of the German army, suddenly died from heart failure, on November 27, while lecturing to a class of veterinary staff officers, who were detailed for a short course at the Military Veterinary Academy at Berlin. The general was 64 years of age, but was considered to be of excellent health, so that his unexpected demise was a shock to his many admirers in the German army.

The personality and career of Dr. Hell were notable. Tall and handsomely built, of clear and decisive mind, a scholar, he was possessed of a broad knowledge of affairs veterinary at home and abroad. Besides, nature had endowed him with a heart full of human kindness, and his cordial manners and fascinating conversation captured the listener at once. Those who knew him long showed a sort of reverence towards him.

Graduating at the Military Veterinary Academy at Berlin in 1870, he went through the latter part of the Franco-Prussian War, and then became an assistant veterinarian in a remount station. Here he was soon recognized as an exceptionally keen judge of horses, so that in 1887 he was chosen as instructor in hippology at the Military Veterinary Academy. While in this position, he showed himself to be gifted in many ways. At that time conditions at the academy and in the army veterinary corps were turbulent, owing to a change of regime from a purely military supervision to a more professional. He threw his personality between the battling factions and stayed them. Perceiving that there was an immediate need of uniting all for a higher, common purpose, he founded an army veterinary journal in 1888 as a medium for contributions from the rich field of army veterinary practice, and he succeeded in turning the attention of his army colleagues away from strife towards scientific labors. He also secured authority to establish an army bacteriological laboratory, wherein veterinary officers could secure special information and help, and undertake certain lines of research work. He himself gave the example by plunging energetically into an

investigation of the various micro-organisms supposed to cause the influenza of horses and made himself a name as a noted pathologist.

In 1895 he was promoted to major in the veterinary corps and attached to the staff of an army corps, and in 1908 he was selected as veterinary general, a newly created rank. In this position he was in command of the army veterinary corps, as also director of the Military Veterinary Academy, himself de-



Generalveterinär Dr. Franz Hell.

livering the lectures on "Special Horse-Breeding for the Army." How skilfully and successfully he took up the reins of this doubly responsible position is now being commented upon in German veterinary journals. He had been decorated by the Emperor with several orders of merit.

The burial services, as described from abroad, were exceptionally touching, owing to the general love shown the deceased. Emperor William sent a floral tribute in the shape of a laurel wreath with the dedication: "Died on the field of honor."

I have taken it upon myself to chronicle the foregoing, thinking that it might inspire those of our friends who are now bat-

ting for the improvement of our own army veterinary service. I further perform a duty by making the following statement: When visiting Berlin in November, 1912, I called on Dr. Hell to pay my respects to him as the head of the German army veterinary corps. I had gone abroad to observe and to learn, and avoided everywhere to comment upon our veterinary troubles at home. But, almost at once, Dr. Hell turned the conversation to the conditions of our army veterinary service. He knew of Huidekoper and Hoskins, and, excepting details, he thoroughly understood our situation, to my great surprise. When I asked for information regarding the working of the German veterinary corps, he explained the regulations with perfect frankness. He also showed large maps, giving the organization of the veterinary corps of *all* armies of the world. There was a blank left for the U. S. army, which he hoped to be able to fill out soon. When, a month later, I wished good-bye to him, he said with feeling:

"Please convey to your comrades in the U. S. army the assurance of my deep interest in your struggle for recognition, and I pray that you may soon be successful. When you win you will find yourself cemented together into a corps, and then your good work shall be recognized by your army, as it has been recognized by all others. This is sure to come, and then your army will wonder why you were not given sooner the right of liberty in your chosen professional work."

I had no opportunity to deliver this message, scattered as we are over all the states and the insular possessions, but I cannot withhold it any longer. I have also requested the editor to give us the likeness of our dead friend, now resting unto eternity after a well-spent life, so full of sympathy that he knew no boundaries of earthly empires.

OLAF SCHWARTZKOPF.

RETIRED ON ACCOUNT OF ILL-HEALTH.—Dr. Jno. Spencer has retired from the Northwestern Hog Cholera Serum Manufacturing Company at So. St. Paul, Minnesota, on account of ill-health. In expressing sympathy for the doctor in his illness, and a hope that he may be speedily restored to health, the REVIEW voices the sentiment of the entire profession.

THE NORWICH PHARMACAL COMPANY'S CHANGE OF ADDRESS.—This drug house has changed the address of its New York City branch, from 60 Beekman street to 57-59 East 11th street.

SOCIETY MEETINGS.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION.

The 17th annual meeting of the United States Live Stock Sanitary Association was opened in one of the assembly rooms of the Hotel Sherman, Chicago, Ill., by President Bahnsen, December 2, 1913, at 10 a. m.

The president introduced Dr. Colwell, president of the Chicago Medical Society, who in a sincere manner complimented the association on the high character of the work which it is carrying on and assured us of the growing appreciation of our worth by the medical profession and the general public.

Secretary Ferguson announced that Dr. Colwell and other representatives of the Chicago Medical Society had requested an audience to arrange if possible a joint meeting, whereby one of the days of our next meeting, if held in Chicago, could be given over to the discussion of correlated subjects. Later, during the meeting, Drs. Colwell, Evans and Black, in behalf of the Medical Society and Milk Commission, extended very courteously an invitation to join them, and suggested that the president of the U. S. Live Stock Sanitary Association appoint a committee, which would take up the matter with a committee from the Medical Society and arrange for holding a public meeting where speakers from both associations would discuss food inspection, particularly meat inspection, and also that an arrangement be made for a demonstration as to methods by which our meat inspection is carried out at the abattoirs.

The reading and discussion of papers were carried out practically in the order as presented on the program, which was as follows:

[NOTE]—The REVIEW was represented at the above meeting by Dr. John F. De Vine, of *staff*, to whom its readers are indebted for this interesting report of its proceedings.

"U. S. Government Meat Inspection," V. A. Moore, Cornell University; "Investigations with Swamp Fever," L. Van Es, North Dakota; "Measles in Live Stock and Its Relation to Rural Sanitary Conditions," B. H. Ransom, Washington, D. C.; "Comparative Value of Various Tests for Glanders," J. R. Mohler and Adolph Eichhorn, Washington, D. C.; "Methods of Controlling Glanders in New York State," J. F. DeVine, New York; "The Control of Hog Cholera—A Review of Four Months' Work by the Bureau of Animal Industry," M. Dorset, Washington, D. C.; "Safest Point at Which to Inject Hog Cholera Serum," W. H. Chrisman, Virginia; "How May a State Most Effectively Combat Hog Cholera?" J. W. Connaway, Missouri; "Necessary Equipment of State Laboratories for the Production of Hog Cholera Serum," Paul Fischer, Ohio; free discussion of above topics and all phases of hog cholera questions open to the meeting; "Demonstration Exhibit," A. T. Peters, Illinois; "The Purity of Farm Water Supply and Practical Methods of Insuring Clean Drinking Water for Live Stock," H. A. Whittaker, Minnesota State Board of Health; "Effects of Poor Ventilation on the Health of Animals," C. C. Lipp, South Dakota; "Elimination of Sources of Contamination in Milk," Prof. W. D. Frost, University of Wisconsin; "Consideration of Report of the National Commission on Milk Standards," presented by M. P. Ravenel, Wisconsin; "The Present Status of the Control of Tuberculosis by Vaccination," S. H. Gilliland and C. J. Marshall, Pennsylvania; "The Possibilities and Limitations of the Intra-Dermal Test for Bovine Tuberculosis," C. M. Haring, University of California; "Delayed Reaction Following Injection of Tuberculin," J. G. Wills, New York; "Bovine Tuberculosis in Illinois—Modern Method of Handling in Pure-Bred Herds," O. E. Dyson, Illinois; "Proper Basis for Inter-State Recognition of Health Certificates," S. H. Ward, Minnesota; "Present and Future Attitude of the Railroads Toward Live Stock Sanitary Control Work," F. S. Brooks, general live stock agent, Santa Fe Railway; "Control of Hog Cholera by Slaughter Methods," Dr. Geo. Hilton, chief veterinary inspector for Canada; "Necessary Regulations for Inspection and Disinfection of Horses and Mules for Inter-State Shipment," C. E. Cotton, Minnesota; "Official Inspections on Inter-State Cattle," C. J. Marshall and S. H. Gilliland, Pennsylvania; "Suggestions for Improvement in Method of Certifying to

Health of Animals Shipped from Canadian Provinces into the United States," W. J. Butler, Montana, W. F. Crewe, North Dakota, Jas. I. Gibson, Iowa, and O. H. Eliason, Wisconsin; "Reasons Why Some Infectious Diseases Have Not Been Eradicated," C. A. Cary, Alabama; "The Most Successful Methods of Tick Eradication," Geo. R. White and J. A. Kiernan, Tennessee.

The lack of discussion was noticeable and comments on the loss of this part of the meeting were heard frequently throughout the convention halls, until some of the members attempted to remedy it by at least starting discussions on the various papers.

As a result of this effort the paper by Dr. Dorset on hog cholera was freely discussed. It was Dr. Dorset's opinion that both the serum and simultaneous treatment have virtue, but must be carried on in addition to the recognized cardinal principles of sanitation. In the control of hog cholera Dr. Conway placed education and sanitation first and serum last. Dr. Fischer described briefly the arrangement and equipment of the Ohio serum plant, which has been completed at a cost of \$100,000 and is said to be one of the most ideal in this country.

A paper by Dr. Shem on the control of hog cholera in Germany was read by Dr. Stange.

The paper prepared by Drs. Gilliland and Marshall on tuberculosis and vaccination was presented by Dr. Gilliland. Among other things this paper tended to show that the use of tuberculin only produced toxic immunity and not immunity against the tubercle bacilli, but that vaccination of living bacilli increased the immunity against natural infection; he stated that there are some problems yet to be worked out, such as the questions of early exposure to infection and the duration of the immunity period; also that vaccinated animals are certainly for a time—say, four to six weeks after vaccination—more susceptible to infection than unvaccinated animals, but that after this hypersensitive period the resistance is surely increased, it is still a question whether the immunity is carried sufficiently long to be of practical value. Continuing the immunity by repeated vaccination of living tubercle bacilli is considered unwise, as the living organisms appear in the products.

The conclusions drawn were that animals should be immediately removed at birth from all sources of contamination and during a period for eight weeks following vaccination especial care should be taken as to the possibility of exposure to con-

tagion, that after this period there is a pronounced increase in immunity for a period of probably two years.

The paper by Dr. George Hilton on the control of hog cholera in Canada by slaughter methods was discussed, some being of the opinion that this method seemed hardly feasible where valuable pure-blood hogs predominate and where hog cholera is extensive.

The question of disinfection for hog cholera brought forth from Dr. Dorset a statement which must have been interesting to every one, and was particularly so to the writer. Dr. Dorset stated that in his opinion carbolic acid was not a satisfactory disinfectant for the control of hog cholera, as blood kept six weeks in contact with a two per cent. solution of carbolic acid was found to be still virulent. Dr. Dorset prefers a three per cent. solution of compound cresole. The necessity of burning all carcasses seemed to be agreed on as the only safe method of disposal. The burning of frame pens and the liming of infected yards and fields, followed by plowing, is apparently a satisfactory way of controlling the contagion.

Mr. F. S. Brooks' remarks on railroad co-operation were warmly received, and we predict a marked improvement in our live stock movements, the exasperating annoyance of which under past conditions can only be realized by those directly interested.

Following several delayed reports, the election of officers was taken up. Dr. S. H. Ward, of Minnesota, was chosen president, and when called upon for a speech, proved that the honors had not awed his humor. Prof. Ferguson was again enthusiastically chosen to fill the office which he has so commendably and kindly taken charge of for so many years.

Following Prof. Ferguson's enthusiastic remarks on the association's future, G. Ed. Leech, of Minnesota fame, moved a vote of thanks for the able and congenial assistant secretary. "To the manner born," we all responded with a rising vote. Leech's exuberance again asserted itself and called for a speech, and the young lady's prompt retort, suggesting that it be in order to have Dr. Leech taken from the room, brought forth such a burst of applause that it was evident that "she had made a speech."

Thursday, December 4, being the last day of the meeting, and the work of the meeting now completed, President-elect Ward declared the 17th annual meeting, which was one of the most successful meetings of the association ever held, adjourned.

PRESIDENT WM. M. BURSON'S ADDRESS BEFORE
THE GEORGIA STATE VETERINARY
ASSOCIATION.

Gentlemen of the Georgia State Veterinary Association—It is with great pleasure that I rise to address you to-day. At the last annual meeting I was honored by election to the office of President; and while the duties of the office are not irksome I appreciate very much the confidence in me as expressed by the Association.

The veterinary profession is young in the South. While there are among you some who have been located here for many years, the average veterinarian of Georgia is either a newcomer to the State within the last five years or is a recent graduate.

The properly qualified veterinarian is being appreciated at his true worth by Georgia farmers and live-stock owners more and more as time rolls on. I am sorry to state, however, that there are many farmers in the State who never saw, much less employed, a properly qualified veterinary practitioner.

This condition, I may also state, is undergoing a rapid change. The many influences which are at work on the development and protection of Georgia's live stock industries are in great measure to be credited with the increasing popularity of the veterinary practitioner through acquainting the live stock owning public with some features of veterinary work. In this connection I may mention the work in tick eradication which for several years has been in progress by the U. S. Bureau of Animal Industry in co-operation with the State Veterinarian and the support and encouragement of the work by the State College of Agriculture and various mercantile organizations. As an example of what is being accomplished in this line, I may state that three years ago several head of cattle of the College herd died of tick fever, and outbreaks of the disease were common throughout this and adjoining counties. The College herds have now been free of ticks for two years, and this and several other counties have been freed of ticks and released from federal quarantine. Tick fever is now unknown throughout these counties, and the cattle industries therein are placed on a better basis.

Tick eradication is the first great step necessary for the establishment of a well developed and profitable cattle industry throughout the South and should have not only the approval but the hearty support of the veterinary profession. The great

shortage of cattle throughout the United States has drawn attention to the cattle raising opportunities of the South and has resulted in enhanced interest in cattle by the southern farmers. It is well that this interest be encouraged in order that the work may be carried on more rapidly in the future than in the past.

The manufacture of hog cholera serum by the College of Agriculture and its distribution by the State Veterinarian.

The various rules and regulations of the State Department of Agriculture governing the shipments, into and within the State, of cattle and other animals.

The work in live stock improvement being carried on by several railroads of the State, notably, The Southern Railway and The Central of Georgia.

Last but not least the distribution of pure bred and high grade live stock throughout the State by and through the influence of the State College of Agriculture and farm demonstration agents.

Any and all influences tending toward the increased interest in more and better live stock may be cited as being conducive to the betterment of opportunities for the veterinary practitioners. The value of live stock on Georgia farms increased from \$35,200,000 in 1900 to \$78,118,000 in 1910, an increase of more than 120 per cent.

The increase in numbers and value is proof of fact of increased demand for the services of properly qualified men.

Some Georgia cities have come to the realization that municipalities require the assistance of the veterinary profession in the proper performance of the duties of their Departments of Health. Already three cities have installed municipal meat and dairy inspection under qualified veterinarians and I am informed that several other cities of the State anticipate the early inauguration of similar systems of inspection.

The work of inspection of abattoirs and dairies throughout the State by officials of the State Department of Agriculture has shown the need of the establishment of this work in many localities. In this line of work the profession does the general public a great favor. "He who guards the nation's food supply is indeed a public benefactor."

The illegal practitioner we have with us always. He and his kind are present in considerable numbers in this and every other State. His elimination from the field is largely dependent upon the education of the live stock owners and the rendering of service of which he is not capable. All possible influence should

be exerted to keep out of his hands those medicines and biological products used by qualified veterinarians.

The advertising quack and charlatan who flaunts his wares in the face of the reading public from the pages of agricultural and live stock papers must be fought at every opportunity. Some few papers have taken a stand against such advertising and have thereby voluntarily reduced their income. Such papers are of great value to the profession and deserve its hearty support. I may mention here one distinctly southern publication of this class; *The Progressive Farmer*, published in Raleigh, N. C., and Memphis, Tenn., of which our eminent colleague, Dr. Tait Butler is editor. I have been informed that the stand taken by this paper reduced its advertising business to the extent of \$20,000 annually.

I would like to see this organization pass a resolution of commendatory nature *and forward a copy to Dr. Butler.*

During recent years biological products in great variety have come into general use in the practice of veterinary medicine. The great and sudden popularity of these preparations resulted in the placing on the market by unscrupulous persons of products of little or no value. This condition called for legislative interference. I have pleasure in stating that Georgia and Alabama were among the first States to pass bills regulating the sale of these products. The recent legislation by the Congress providing for regulation and inspection of plants preparing these biological preparations will do much to provide for the practitioner a more reliable supply.

The veterinarians of the South have the opportunity of doing great work not only in aiding in the development and protection of the live stock industries, but also in conserving the health of rural as well as urban populations. As a sanitarian the practitioner is qualified to give the farmer advice concerning farm and home sanitation. He is able to offer advice concerning the construction and arrangement of dairy barns and milk houses. He can instruct in regard to the things necessary to prevent contamination of the water supply. He can inform the farmer concerning the dangers incident to the improper disposal of sewage materials. He can point out to the owner the dangers to himself and family of the presence of animals affected with diseases and parasites transmissible to people. In fact, I know of no field of human endeavor which offers greater opportunities for beneficial service than is granted to members of the veterinary profession.

The greatest thing in life is the rendering of service to others.

The greatest man is he who has been enabled to render the most service to humanity.

Meetings such as this are beneficial in an instructional way and serve to bring together the members of the profession for closer acquaintance and better fellowship. Don't be a clam. Open up and freely discuss the matters brought before the meeting. If you know of something new and good, out with it, that all may be benefited. If it is information you seek, speak up and let us discuss the problem. Perhaps we may be able to solve it.

I hope all who are here will be able to go home with the feeling that what he has seen and heard while here has benefited him and made him a better veterinarian, and with the firm resolve to take a livelier interest than ever before in the Georgia State Veterinary Association.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

At the St. Cloud Hotel, Syracuse, N. Y., on November 25, 1913, was held the fourth semi-annual meeting of the Central New York Veterinary Medical Association. The following members were present: Dr. W. G. Hollingworth, Dr. H. A. Turner, Dr. W. B. Switzer, Dr. F. E. York, Dr. J. A. Pendergast, Dr. L. M. Currie, Dr. L. G. Moore, Dr. D. C. Papworth, Dr. W. M. Pendergast, Dr. E. E. Cole, Dr. J. G. Hill, Dr. E. E. Dooling, Dr. Frank Morrow, Dr. W. L. Clark, Dr. C. R. Baldwin, Dr. E. D. Hayden, Dr. R. C. Hurlburt, Dr. R. M. Weightman, Dr. A. H. Ide, Dr. J. C. Stevens, Dr. J. V. Townsend, Dr. A. E. Merry, Dr. E. W. Fitch, Dr. C. E. Morris, Dr. J. K. Boss-hart. M. A. Switzer, attorney for the association, was also present, and the guests were: Dr. P. A. Fish, of the New York State Veterinary College, Dr. J. G. Wills, chief veterinarian of the State Department of Agriculture, Dr. J. H. Taylor, Henrietta, Dr. W. L. Baker, Buffalo, F. J. Switzer, Fulton, W. W. Otto, representing Sharp & Smith, and M. F. Allen, representing DeVoe-Havers Company. Dr. C. R. Guile of Fulton, Dr. W. F. Burleigh of Oneida and Dr. F. D. Markham of Port Leyden were present and presented applications for membership, which were favorably acted upon.

The matter of the prosecution of illegal practitioners was discussed at length and resolutions were passed authorizing the prosecuting committee to immediately commence proceedings against one illegal practitioner, evidence of whose practice had been secured, and providing for the prosecutions of others upon the production of necessary evidence.

The visitors were given the privilege of the floor and took part in the discussion of papers as well as in other matters of interest to the members. Papers were presented as follows:

"Johne's Disease," Dr. Charles E. Morris; "Case Report on Rupture of the Stomach in Gray Gelding," Dr. W. L. Clark; "Future Veterinary Legislation or Duties of the Veterinarian of the Future,"* Dr. W. G. Hollingworth; "Intussusception of Ileum in Cow," Dr. J. K. Bosshart; "Some Interesting Cases in Canine Practice," Dr. W. M. Pendergast.

The papers were all very interesting and were well discussed. Following the completion of the regular program, an informal discussion of matters of interest to the profession was held, at which time the value of various drugs, as demonstrated in everyday practice, was given careful attention.

Preceding the business session, a clinic was held at the infirmary of Dr. H. A. Turner, in South Salina street. The first operation was that of cunean tenectomy for the relief of spavin lameness, performed upon the left leg of a large bay gelding by Dr. A. H. Ide of Lowville, N. Y. Median neurectomy upon the right arm of a bay gelding for the relief of navicular disease was performed by Dr. F. E. York of Earlville, who also performed a similar operation upon the right arm of a large white mare, for the purpose of relieving lameness from a low ring-bone. The ears of a Boston bull terrier were cropped by Dr. W. L. Baker of Buffalo. The dog was anesthetized by a mixture of chloroform and ether, the ears brought together over the head and marked and cut with scissors. The last operation for the relief of laryngeal stridor was performed upon a large black mare by Dr. York of Earlville.

A banquet was held at the St. Cloud Hotel following the meeting. All things considered, this was the best meeting held by the association since its organization. A pleasing spirit of harmony prevails among the veterinarians of the territory, for which this society was organized, and its success is thus assured.

W. B. SWITZER, V.S., Secretary.

* Published elsewhere in this issue.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	June 6-7, 1913.....	Birmingham.....	P. K. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1914.....	141 W. 54th St. New Orleans, La	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.....	Dec., 28-31, 1914.....	New Orleans, La	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n.....	January, 1914.....	Ft. Smith.....	J. B. Arthur, Russellville.
Ass'n Médéciale Veterinaire Française. "Laval".....	1st and 3d Thur. of each month.....	Lec. Room, La- val Un'y, Mon. Chicago.....	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	S. Omaha, Neb..	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n.....	Monthly.....	St. Joseph and vicinity	F. W. Caldwell, St. Joseph, Mo.
California State V. M. Ass'n.....	December 10, 1913.....	San Francisco.....	John F. McKenna, Fresno.
Central Canada V. Ass'n.....	Feb. and July.....	Ottawa.....	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Syracuse.....	W. B. Switzer, Oswego.
Chicago Veterinary Society.....	2d Tues. each month.....	Chicago.....	D. M. Campbell, Chicago.
Colorado State V. M. Ass'n.....	May 28-29, 1913.....	Ft. Collins.....	I. E. Newsum, Ft. Collins.
Connecticut V. M. Ass'n.....	Feb. 3, 1914.....	Hartford.....	B. K. Dow, Willimantic.
Delaware State Vet. Society.....	Jan., Apl., July, Oct.....	Wilmington.....	A. S. Houchin, Newark, Del.
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Newark, N. J.....	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n.....	2d week, July, 1913.....	Rochester.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Atlanta.....	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y.....	1st Sat. each month.....	Wash., D. C.....	I. M. Cashel.
Hamilton Co. (Ohio) V. A.....	.....	.....	Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n.....	December, 1913.....	Chicago.....	L. A. Merillat, Chicago.
Indiana Veterinary Association.....	Jan. 14, 1914.....	Indianapolis.....	A. F. Nelson, Indianapolis.
Iowa Veterinary Ass'n.....	Pending.....	Pending.....	C. H. Stange, Ames.
Kansas State V. M. Ass'n.....	Jan. 6-7-8, 1914.....	Manhattan.....	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.....	Oct. & Feb. each year.....	Lexington.....	Robert Graham, Lexington.
Keystone V. M. Ass'n.....	2d Tues. each month.....	Philadelphia.....	Cheston M. Hoskins.
Lake Erie V. M. Association.....	Pending.....	Pending.....	Phil. H. Fulstow, Norwalk, Ohio.
Louisiana State V. M. Ass'n.....	Sept., 1913.....	Lake Charles.....	Hamlet Moore, New Orleans, La.
Maine Vet. Med. Ass'n.....	Jan. 14, 1914.....	Portland.....	H. B. Wescott, Portland.
Maryland State Vet. Society.....	.....	Baltimore.....	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.....	4th Wed. each month.....	Young's, Boston.....	J. H. Seale, Salem.
Michigan State V. M. Ass'n.....	Feb. 3, 4, 1914.....	Lansing.....	W. A. Ewalt, Mt. Clemens.
Minnesota State V. M. Ass'n.....	Jan. 14-15-16, 1914.....	St. Paul.....	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.....	June 30, July 1-2, '13.....	Omaha.....	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n.....	July, 1913.....	Kirksville.....	S. Stewart, Kansas City.
Montana State V. M. A.....	Sept. 24, 25, 1913.....	Helena.....	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.....	1st Mo. & Tu., Dec. '13.....	Lincoln, Neb.....	Carl J. Norden, Nebraska City.
New York S. V. M. Soc'y.....	Sept., 1914.....	Rochester.....	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.....	June, 1914.....	Wilson.....	J. P. Spoon, Burlington.
North Dakota V. M. Ass'n.....	Aug. 6-7, 1913.....	Fargo.....	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.....	Nov. 1913.....	Delphos.....	E. V. Hoyer, Delphos.
Ohio State V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med.....	Annually.....	Upper Sandusky.....	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.....	.....	.....	J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.....	Fall, 1913.....	Oklahoma City.....	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.....	1st Week in Feb. 1914.....	Toronto.....	L. A. Willson, Toronto.
Pennsylvania State V. M. A.....	Sept. 16, 1913.....	Not selected.....	John Reichel, Glenolden.
Phillipine V. M. A.....	Call of President.....	Manila.....	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.....	4th Tues. each month.....	Portland, Ore.....	Sam. B. Foster, Portland, Ore.
Province of Quebec V. M. A.....	.....	Mon. and Que.....	Gustave Boyer, Rigaud, P. Q.
Rhode Island V. M. Ass'n.....	Jan. and June.....	Providence.....	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns.....	Pending.....	Pending.....	B. K. McInnes, Charleston.
South Illinois V. M. and Surg. Ass'n.....	Aug. 5-6-7 1913.....	Fillmore.....	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors.....	1st Wed. fol. the 2d Sun. each month.....	St. Louis.....	Wm. T. Conway, St. Louis, Mo
Schuylkill Valley V. M. A.....	Dec. 17, 1913.....	Reading.....	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.....	.....	Philadelphia.....	B. T. Woodward, Wash'n, D. C
South Dakota V. M. A.....	Pending.....	Madison.....	S. W. Allen, Watertown.
Southern Aux. of Cal. S. V. M. Ass'n.....	Jan., Apl., July, Oct.....	Los Angeles.....	J. A. Dell, Los Angeles.
South St. Joseph Ass'n of Vet. Insp.....	4th Tues. each month.....	407 Illinois Ave. Nashville.....	H. R. Collins, South St. Joseph.
Tennessee Vet. Med. Ass'n.....	November, 1914.....	College Station.....	O. L. McMahon, Columbia.
Texas V. M. Ass'n.....	Nov., 1913.....	St. P.-Minneap.....	Allen J. Foster, Marshall.
Twin City V. M. Ass'n.....	2d Thu. each month.....	Salt Lake City.....	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.....	Spring of 1914.....	.....	E. J. Coburn, Brigham City.
Vermont Vet. Med. Ass'n.....	.....	.....	G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta.....	.....	.....	C. H. H. Sweetapple, For. Saskat- chewan, Alta., Can.
Vet. Ass'n Dist. of Columbia.....	3d Wed. each month.....	514 9th St., N.W. Winnipeg.....	M. Page Smith, Washington, D. C.
Vet. Ass'n of Manitoba.....	Feb. & July each yr.....	Trenton.....	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.....	January 8, 1914.....	141 W. 54th St. Jersey City.....	E. L. Loblein, New Brunswick.
V. M. Ass'n, New York City.....	1st Wed. each month.....	Old Point Comf't Pullman.....	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.....	Monthly.....	.....	T. F. O'Dea Union Hill, N. J.
Virginia State V. M. Ass'n.....	July 10, 1913.....	.....	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.....	1st & 3d Fri. Eve.....	.....	R. J. Donohue, Pullman.
Washington State V. M. A.....	June 1914.....	Walla Walla.....	Carl Cozier, Bellingham.
Western Penn. V. M. Ass'n.....	3d Thu. each month.....	Pittsburgh.....	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.....	July 16-17, 1913.....	Milwaukee.....	J. W. Beckwith, Shallsburg.
York Co. (Pa.) V. M. A.....	June, Sept., Dec., Mar.....	York.....	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

PRIZE WINNERS: Turn to page 16 (adv. dept.) for an explanation. Then write the house whose announcement you find there for samples and literature. You are at liberty to say you saw it in the REVIEW, and it will bring you a prompt response.

WOCHER'S NEW UP-TO-DATE MEDICINE CASE is the heading that surmounts the advertisement of that firm on page 13 of this issue. Other "specials" are also featured in the advertisement, and the Fourteenth Edition of their Veterinary Catalogue can be had *free* by writing them mentioning the REVIEW. Their address will be found on the page referred to above.

IMPORTANT ANNOUNCEMENT—ANTI-RABIC TREATMENT IN ANIMALS AN ECONOMIC POSSIBILITY.—This is interesting to veterinarians, *very* interesting. With your interest thus aroused, turn to page 21 (adv. dept.) of this issue and read the announcement, then write to the address you find there for a circular containing information concerning the treatment; which, if you mention the REVIEW, will be promptly sent you.

AMERICAN VETERINARY REVIEW.

FEBRUARY, 1914.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, 15th December, 1913.

NERVOUS DISEASES IN DOMESTIC ANIMALS.—Continental veterinary periodicals have recently published valuable observations and articles relating to the pathology of nervous affections in animals. Mentioning only for the present, until further consideration, those of Prof. G. Petit, of Alfort on Poliomyelitis, I will extract to-day from an article translated in the *Revue Generale* from the *Archiv. für Wissenschaftliche und praktische Tierheilkunde* and which is due to Prof. Sonnenberg, of Greifswald, "on the diseases of the spinal cord in our animals," perhaps principally dogs.

Beginning by some notions upon the structure and functions of the spinal cord and on general and special neurology, Sonnenberg then gives the description of a case of *menatomyelitis* in the region of the medullary cone and of the last sacral roots in a dog. The animal had dropped from the second story of a house, did not show any trouble of motility immediately, but a few moments later his hind quarters refused to work and failed to support him.

The next day the dog was lying down unable to get up. He shows no pain. Held standing, he is supported by the forelegs, but the hind ones only do so for a few moments. He can sit down

on his rump. No abnormal sensibility is observed about the thighs and there is no deformity of the vertebral column.

When pressure is applied over the lumbar region, the dog cries and the pain is stronger if pressure is made, especially on the muscles. The croup and the superior part of the thigh show great sensibility. This however is less on a level with both faces of the thigh, towards the anus and perineum.

The tendinous reflexes are exaggerated. Sonnenberg promotes them as he indicated on previous occasions; the patellar reflex, that of the Tendo Achillis, that of the flexors are obtained in the same way. Same increase of the cutaneous reflex inside and outside and also of the periostic reflex of the dorsal vertebrae.

The whole leg is thrown backwards under the influence of a slight pressure made upon the adductors of the thigh. Percussion of the extensors of the patella throws the leg in forced extension, the thigh of the opposite side makes the same motion. This position is held for a little time. Micturition and defecation take place with very little difficulty.

After five days, the paralysis disappeared and recovery took place rapidly. It was complete a month later.

Sonnenberg attributes the recovery to injections of "lacto solutio," a preparation of an albuminoid substance extracted from milk, which injected sub-cutaneously gives rise to a vasodilatation of the small arteries, specially of the skin, tendons and muscles. Lacto solution is injected in dogs in the doses of 2 c.c., and in horses of 10 c.c.

* * *

Continuing on his subject, Sonnenberg relates a case of *traumatic myelitis of the lumbar region with hematomyelia* in a dog six years old, which became suddenly sick and became paralyzed in a few hours in the hind legs. He was supposed to have received a blow against a door. He had opisthotonos of the neck and poll, being indifferent to all surroundings,

whether when standing or lying. The opisthotonos was not permanent, at times slight, at others quite severe, principally by the slightest touch. There was no motor trouble in the muscles of the poll or of the neck, but only a condition of contraction, marked also about the masseters. The forelegs were readily moved, but the contraction of the extensors more marked than that of the adductors.

The hind quarters were paralyzed. The dog unable to stand up, fell down at every attempt with the hind legs taking any abnormal position, of which the dog seems to take no notice.

Excitation on the extensors, principally round the patella, brought about an extension lasting thirty or sixty seconds. During that condition, it was difficult to bring the leg in relaxation. The patellar reflex persisted on both sides.

Reaction to pain was limited in the hind legs and on the level with the last dorsal vertebrae. Exactly opposite the last there was a zone of hyperesthesia. Urine escapes drop by drop.

Eight days after, opisthotonos had disappeared. The spasmodic paralysis had become permanent. The sensibility returned little by little, the cutaneous and tendinous reflexes returned. At that time "lacto solutio" was injected and recovery occurred by degrees. The dog however died from infection following lesions of long decubitus.

* * *

Two other observations, still more interesting, are then recorded.

Since two months a slut shows trouble in the locomotion of her hind legs, which began during a period of gestation. Over the lumbar region she has a hairless bluish spot, probably some traumatism. But since four weeks, on the back, and specially the rump, all the hairs have fallen without cause to explain it. The animal is lively and acts as a healthy dog. Yet, in walking, the lumbar region moves from side to side, the hind legs flex, there is true ataxy of the left side.

Local examination reveals nothing but exaggerated patellar reflex. Cutaneous sensibility is normal. Injections of "lacto solutio" are prescribed. Improvement takes place and soon the walking of the dog is normal. Fifteen days after, relapse, urination is very frequent, in small quantity and by drops. There is great weakness of the hind quarters. The muscles became atrophied, the reflexes are no longer present. The animal is killed and while there is no anatomical change in the spinal cord, histology revealed a condition of *disseminated myelitis*.

For the other case, it is one of *hematomyelin* of the lumbar region—swelling of the cord. Ten hours before he is seen a dog has been run over, he has been able to make a few steps and then dropped—paralysis. General aspect is good, appetite present, no appearance of pain. When the animal tries to get up, the hind quarters are scarcely raised. Patellar and anal reflexes are present. Percussion of the extensors of the patella produces convulsive contraction of the leg. Sensibility to pain is absent in the hind quarters as far as the last dorsal vertebrae. No zone of hyperesthesias.

Two days after treatment is begun. Patellar reflex is exaggerated, so is the abdominal. About the first lumbar and last dorsal vertebrae a region of hyperesthesia is observed. Sensibility to pain has disappeared. There is retention of urine and constipation. After two months of treatment with "lacto solutio" incomplete recovery took place.

The long article is concluded by the concise relation of a *spasmodic spinal paralysis* in a horse, and those of other cases relating to amyotrophic lateral sclerosis, all of which Sonnenberg compares with similar cases observed in man.

* * *

INBORN OR SPECIFIC APTITUDE WITH TUBERCULOSIS MICROBE.—Professor A. Chauveau, at the *Academie des Sciences*, has lately related the researches that he has made to determine if there can exist a difference between human and bovine tubercu-

losis, from the point of view of the inborn or specific aptitude of robust individuals to receive or cultivate the microbe of tuberculosis. And from his researches the learned Professor was brought to the following conclusions:

1. There cannot exist any difference between the two species, human or bovine, from the point of view of the inborn or specific aptitude of robust individuals to receive or cultivate the bacillus of tuberculosis.

This is the necessary consequence of the scientific principle which imposes the unity and permanence in the laws that govern the manifestations of life, as all the other natural phenomena.

2. Thanks to this inborn aptitude, common to both species, and reserve made of possible, although little probable, meeting of individuals spontaneously immunized by unsuspected interference of a prophylactic classical influence, all human or bovine subjects, in perfect health, which would have received in like conditions active tuberculous bacilli would become infected in about the same manner.

3. Therefore, in the experiments of transmission of tuberculosis from cattle to cattle, all the subjects, without any exception, having contracted the disease it would necessarily have been the same if the experiment had had in view the transmission of tuberculosis from man to man.

4. Anyhow, clinical observations, only sources from which can be obtained the elements of a material evidence of the results of such hypothetical experiment, give indications which agree with those imperiously imposed by general laws of contagion.

5. Indeed, these clinical observations furnish a great number of examples of the most vigorous subjects which contracted tuberculosis as well as weak individuals in contaminated centers.

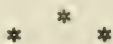
6. They also show with the same value that among the large number of individuals which escape infection in contaminated centers there are always weak organisms mixed with the robust. To find the cause of this resistance to contagion it is not in the conditions of the soil of the culture of the bacillus that it must be looked into. It is to the bacillus itself and to the more

or less favorable conditions that it may offer to the success of its implantation in the soil of the organism.

7. These are propositions firmly established, which complete in characterizing the non-value of the theory of the impoverishment of the organism soil as the essential cause of the propagation of the bacillus-germ.

8. At any rate, among the cases of localized centers of tuberculosis kept up by this upheld cause, there is not one where the aggravations or relapse of the disease which were attributed to the introduction and to the suppression of causes of physiological defects have not been connected at the very time with relaxation, the severity of the selection and the elimination of infecting subjects, relaxation and severity which are fully sufficient to explain the oscillations of the curve in the mortality of tuberculosis in human agglomerations.

9. Finally, this last study issued of the comparison between human and bovine species, from the point of view of the aptitude of robust subjects to contract tuberculosis, arrives at the same scientific and practical conclusions. Practically, there will be nothing done in the organization of the anti-tuberculous fight, if the efforts of hygienists do not particularly declare "war to death" to the infecting microbe and provide for the means to render the germ-carriers harmless towards sound subjects which might be exposed to infection.



MORPHIA AND OPIUM IN HORSES.—In the *Annales de Médecine Vétérinaire*, published in Brussels, Professor A. Vanden Eeckhout has recorded an experimental contribution to the study of the effects of these two drugs in horses.

Recalling first the various results obtained by the administration of morphia and of opium in the different species, he reviews those obtained in the experiments made by him and Professor Gottlieb on the action of these medicamentous substances. All those experiments having been made on laboratory animals,

Professor Vanden Eeckhout has thought, with good reason, to carry them out on large animals, and more particularly on horses. The experiments were numerous and resume in the two principal following conclusions :

1. ACTION OF MORPHIA AND OPIUM ON THE NERVOUS SYSTEM OF HORSES.—Writers admit generally that morphia, administered to horses in normal doses, produces a general nervous stimulation, rendering him at the same time less sensitive to pain and principally to that due to sharp instruments. Professor Vanden Eeckhout has never observed after the administration of morphia any analgesic action, but always excitement, even hyperesthesia increasing with the dose given. Under the influence of morphia, horses supported operation with difficulty, and the operator was often obliged to resort to intravenous injections of chloral. The exciting and hyperesthetic action appears every time morphia or ordinary tincture of opium is injected. It is not present when morphia has been taken off from the tincture of morphia revealing itself as a substance almost without action. Morphia promotes specially nervous excitement, while tincture of opium provokes before all muscular stiffness and fibrillar contractions.

2. ACTION ON THE DIGESTIVE CANAL.—First of all the author considers the numerous difficulties that one meets in studying the action of these two drugs in horses. To reach a result, he has searched if morphia and opium can reduce the quantity of feces expelled in twenty-four hours after their administration. From the experiments made in the best conditions, it results that the two agents are constipating when given to horses, the quantity of feces expelled in twenty-four hours is diminished. Tincture of opium with morphia taken off is positively less constipating, while it had remained without influence on the nervous system; ordinary tincture of opium seems to be more efficacious than the two other products.

These experiments are interesting to bear in mind. Indeed, they demonstrate that in horses, whose stomach plays but an accessory part in the phenomena of digestion, morphia gives rise

to constipation by direct action upon the intestines and not by an exciting effect upon the pyloric sphincter.

* * *

TENTH INTERNATIONAL VETERINARY CONGRESS.—A meeting of the Organizing Committee was held on the 10th of October, 1913, to carry on general business relating to this great event, and reported in the English professional journals.

Before a large number of members present, the minutes of the previous meeting were read and a large correspondence presented by the Hon. Secretary.

The treasurer made his report concerning the condition of the new subscriptions and recorded that he had received substantial subscriptions from many parts. He had at present in hand £1,050, and urged all members should send their contributions.

The question of the place of meeting was also considered and a sub-committee appointed to make inquiries and engage the necessary rooms.

Our confrères are aware of the very important step that was taken by the English Committee of organization in suggesting the formation of Propaganda Committees in the various countries of the world, where veterinarians could organize themselves, in view of an attendance at London, where the Congress will be held. Answering to this suggestion from the English Committee of organization, several of the Continental States have already made known the result of the formation of Propaganda Committees. France, Germany, Italy, the United States have already published the names of their constituents, and if all the members whose names are published do come to London next August, the gathering will certainly be tremendous.

As a member of the French Committee we could not very well belong to another, to that of the United States for instance, and on that account could not very well get directly important news from the Committee of organization, but whenever their official

information is made public, I shall allude to it at once, although probably the offices of the REVIEW in New York will have already announced them. For the present, I have to wait, as I have seen nothing recent, but cannot fail to take into consideration the special opportunities that our American confrères will have by joining the "*Study Tour of Europe*," which has been organized in Washington, with Dr. Adolph Eichhorn, of the Bureau of Animal Industry as director of the tour. The program is excellent, the itinerary most inviting, the arrangements perfect, and when one considers the many various opportunities which are offered, instructive as well as enjoyable, there will be no hesitancy, and "I am joining" will be the conclusion. Come on friends and colleagues, and do not let the chance go by without benefiting by it.

If I can be of any assistance to any, let him write to me.

* * *

BIBLIOGRAPHIC ACKNOWLEDGMENTS.—*Twenty-eighth Annual Report of the Bureau of Animal Industry*. This recent publication which is the report for the year 1911 has just been issued, or at least has just been received. It is, as all the preceding, a valuable work. The fact that many of the bulletins which are at various times published by the Bureau and have no need to be again in the final report gives the explanation why the twenty-eighth report forms a small volume in comparison with those that were published before; but with all that it is a book of nearly 350 pages, with quite a number of illustrations, 36, of which 3 are text figures.

The contents of the Report are as usual very interesting, and after the general report of the Chief, Dr. A. D. Melvin, there are several which call the special attention of veterinarians. First comes that of Dr. R. W. Hickman, on the *Government's inspection and quarantine service relating to the importation and exportation of the stock*.

This is followed by a masterly article on *Measles in Cattle*, by

Dr. B. H. Ranson, which is illustrated by seven handsome plates. The article is a good addition to the general knowledge of the cysticercus, from the point of view of the general practitioner and of the inspectors of meat.

Doctors J. R. Mohler and Adolph Eichhorn have furnished in the report a long article relating to *Malto fever*, with special reference to its diagnosis and control in goats. Three plates are illustrating the thorough and complete article of the Chief and of the Senior pathologist of the Pathological Division.

Infectious abortion of cattle and the occurrence of its bacterium in milk follows, with an interesting statement of Dr. A. D. Melvin, to the article of Drs. F. C. Schroeder and W. E. Cotton on the presence of the bacillus of infectious abortion found in milk, the *Bacillus abortus*. This is a very interesting subject with which the readers of the REVIEW have already been made acquainted by the published papers of the authors in that journal.

This article is completed by another from Drs. J. R. Mohler and Jacob Traum on *Infectious Abortion* in cattle, where the complete review of the disease is considered.

Finally, as subjects of veterinary interest, the Chief and the Senior bacteriologists of the Pathological Division write an article on the *Immunization tests in tetanus*, where the standardization of the antitoxin, its applications, and its curative effects are considered, and where the subject of treatment of tetanus by magnesium sulphate calls from the authors the suggestions that more extensive application of the treatment is desirable to judge of its value.

The balance of the report is made up of subjects and miscellaneous information, similar to those that are generally found in this publication.

* * *

BIBLIOGRAPHIC ITEMS.—*Preventive measures* against equine influenza based on its bacteriology, by N. S. Ferry, from the Research Laboratory of Parke, Davis & Co.

From the same, *Correcting Water*, methods of treating hard and alkaline waters. How to remove objectionable ingredients, etc., etc., by H. C. Hamilton.

U. S. Department of Agriculture.—*Important Poultry Diseases*, by D. E. Salmon, D.V.M.

Bureau of Animal Industry. *Regulations* relating to products intended for use in the treatment of domestic animals.

Agricultural Journal of the Union of South Africa.—October, 1913.

Album of Anti-cholera serum plant.—Department of Agriculture of Tennessee, D. G. R. White, State Veterinarian.—(Nashville).
A. L.

THE VETERINARY CONFERENCE AT ITHACA.

The sixth annual conference for veterinarians was opened in one of the lecture rooms of the New York State Veterinary College, Ithaca, N. Y., at 9.15 a. m., January 8, 1914, by Director Moore, who made some general remarks in reference to the unsatisfactory condition in which tissues are sometimes received at the laboratories for examination, and also explaining that in some instances, if the condition of the tissue be ever so favorable, positive information is sometimes impossible. He then gave a splendid talk on contagious abortion, reviewing the disease and pointing out that at present most pathologists were of the opinion that the cause is the bacillus abortis, and that its distribution is in the uterus, foetus and milk, with the probability of fodder, litter, etc., acting as carriers. He said that the virus is probably confined to the animal, but that the organism may live in exposure for a varying length of time. However, as it is not spore forming, it is the present belief that it is not particularly hardy and that a 2½ per cent. solution of cresote is sufficient to destroy young cultures in 2½ minutes, the thermal death point being about 59 degrees Cent. for ten minutes, or thereabout. As to its pathogenesis, it does not produce any

morbid condition other than abortion and the *sequelae*, such as diseased ovaries, and retained placenta in the cow, but it does affect nearly all the organs of the guinea pig.

As to ways of infection, this is one of the difficult aspects of the disease which we are not clear on. It is a question whether the bull acts as a carrier or actually becomes infected. An attempt has been made at the Veterinary College to determine the methods of infection, and accordingly five pregnant cows were injected in the jugular vein with the virus. All aborted in from seven days to a few months after injection. In another similar experiment, one out of three aborted, and in still another, where two were injected, neither of them aborted. Four cows fed the organism, all aborted. Others similarly fed, since, all resisted the virus. Others have been experimented on by subcutaneous injection and by infection per vagina, with varying results. At present we know of no way by which we can take a culture and produce abortion with any certainty in the bovine, but we are almost always successful in the guinea pig by subcutaneous injection, being able to again recover the organism in the uterus. The general belief is that cultivation lessens its virulence.

METHODS OF DISSEMINATION.—It is probable that the dissemination of the virus from the infected animal begins at the time of abortion, but it has not been determined how long it remains in the uterus thereafter. It is believed to be present in most cases for 60 days, but, as with nearly all bacterial diseases, it may in some cases be a much shorter or longer period. It may be present in the milk for a long time, and as to the way of udder infection, most authorities are of the opinion that it occurs through the teat from the infected stable, or vaginal discharges. This would explain its presence in the milk of animals which have not or do not abort. The various methods of diagnosis which have been tried, are the precipitin test, which is not satisfactory, and the abortin test, which is analogous to the tuberculin test. This likewise has not proven satisfactory for general use. The complement fixation test is very complicated for practical

purposes. But any of these reactions may mean that an animal is infected and may abort later, or that an animal may be affected and has aborted, or that an animal may be affected and never abort.

Our present knowledge of vaccine as a treatment has not proven satisfactory. It is Dr. Moore's opinion that strict hygienic measures is the best method of control known to-day.

Following Dr. Moore, Dr. Rich, of the Vermont Experiment Station, stated that while he could not add much to the information given in the bulletin which was issued a few months ago relative to the virtue of methylene blue in treating contagious abortion, it was still his opinion that methylene blue has some advantages in the treatment of this disease, but that we have not sufficient information to base any conclusion as to its being a specific remedy. It is his present belief that small doses, given more constantly, a heaping teaspoonful (about one-third ounce) for four or five months and beginning in early pregnancy, is the most efficient way of using it.

Dr. Williams stated that he had not found a bull in any breeding herd whose blood did not react to the agglutination test, and that in his judgment we have no evidence to show that the bacillus in the udder, vagina or the digestive tract causes abortion, and that, further, it is his opinion that no treatment, either medicinal or vaccine, can reach the utero-chorionic space which in his contention is the seat or origin of abortion.

Prof. S. H. Gage then gave a very interesting and instructive lecture upon eye refraction, stating that the art originated with the astronomer Kepler in 1604. The inversion of the image on the retina and the accommodation of the iris and crystalline lense was very intelligently and simply explained by the use of a lantern and the focusing of the different lenses.

The next speaker was Dr. Theobald Smith, professor of comparative pathology at Harvard University. The world-wide recognition of Dr. Smith as a bacteriologist, and his clear, plain way of expressing the great rôle which vaccines are playing in clinical medicine to-day, made Dr. Smith's address, in our opin-

ion, was one of the most interesting discourses that a body of veterinarians have ever had the good fortune to hear. He pointed out that much of the knowledge of immunity and its application to the human family has been derived from animals. Using hog cholera as an illustration of how even though a virus may be peculiar to one species, that there are various phases which influence even the most specific virus, such as susceptibility of an individual, breed, food, temperature, virulence of the organism, etc.; how that some diseases may be self-limited by acquiring immunity and how that some contagious diseases are very virulent and others rarely fatal. He pointed out the value of vaccine even in such mild diseases as typhoid, where ordinarily but about 10 per cent. of the victims die when the virulence is of the average type, and that vaccines have practically driven the disease from our American army where it was a thing of great dread. His expression of vaccines was that they increased the body's resistance against disease and aid recovery by giving nature a push, so to speak. It was said that the Chinese used direct inoculation to mitigate certain diseases thousands of years ago, and that a close study has shown that the introduction of a virus into a body in a way other than through the natural channels is quite likely to decrease its virulence. Following inoculation of the virulent material, an improved method was demonstrated by Smith and Salmon (Theobald Smith), where the virus was attenuated or killed by heat, and it is by use of dead vaccines that the vaccination for certain diseases has been made possible and useful. There are, however, certain diseases where immunity can only be produced by the living organisms. This is our present opinion, for instance, with reference to tuberculosis. Then, there are some diseases where vaccine is of some value even after the virus has entered the body. Such, for instance, as smallpox, if the vaccine is applied within three days after the infection. And so with rabies, where the character and location of the bite does not make possible an extremely short period of incubation.

His explanation of how in certain chronic cases surgical

interference oftentimes opened up the walled-in tissues which had been deprived of the body fluids where the natural anti-bodies in these fluids could not perform their functions; also that surgical interference produces a hyperemia, augmenting the blood supply to these parts and greatly assisting the work of the vaccines.

Some vaccines will not work satisfactorily when of a different strain or group, and an effort to overcome this is attempted in polyvalent serums and vaccines. The autogenous, of course, is the most scientific and useful and should be used in preference to the others.

Speaking of autotherapy, it is Dr. Smith's opinion that giving the discharges per os is contrary to our knowledge of digestion, where substances are supposed to be broken up and torn apart.

The meeting was then adjourned for luncheon. Following luncheon, we inspected the magnificent new buildings which have recently been erected, and it was the opinion of everyone that the splendid arrangement and the substantial and sanitary construction displayed great merit on the part of those who had to do with the planning; and as a whole are a pride to the veterinary profession and a credit to the state.

In the evening we were favored by the delightful presence of President Schurman, who occupies a warm spot in the heart of every veterinarian who knows him. It seems that each year his personal sacrifices add to our great admiration for him. On this occasion, instead of taking an afternoon train to New York City where business exacted his presence the following day and where he might have spent a comfortable night in the hotel, he deferred his trip so that he might welcome the veterinarians, and then crawled into one of those things termed sleepers that make some of us feel anything but happy who are accustomed to less comforts than is the president.

President Schurman expressed his desire to make the worth of the New York State Veterinary College felt throughout the state. He reviewed the history of the university and stated that the truly modern university was developed in this country, Cor-

nell being the type, where, as expressed by Ezra Cornell, every one can get an education on all sciences taught to-day.

He emphasized the fact that science does not stand still and that such subjects as chemistry, physics and biology have been broadening, which in turn necessitates the broadening of the college curriculum, and that Cornell stands to meet any advancement and is ready to extend its curriculum to a four-year course at such time as conditions seem to require it.

In closing he most cordially invited the veterinarians to return another year.

The next speaker of the evening was J. C. Buckley, of Detroit, editor of the *Horseshoers' Journal*. This paper was illustrated by lantern views which were very interesting, showing different types of conformation of legs and feet, and also various shoes used in orthopedic shoeing.

During the lecture several times when the subject of orthopedic shoeing was being discussed, it occurred to us just how far the shoer could be trusted to carry the paring knife and the hot iron into the domain of surgery, and where the art of shoeing under such conditions would end and veterinary surgery begin. We personally know of a certain shoer in a town where some of the highest class horses in America are cared for; this shoer is recognized as one of the most expert in the country, a man of good education and excellent judgment, but he would not think of attempting to remove the side of a foot or otherwise surgically treat a serious quarter-crack, always advising the owner that such work can only be reliably done by a man trained in veterinary science. There are other shoers in this same town who if they had even a smattering of some of the principles set forth by Mr. Buckley in his paper, to give them a shop full of horses would be like turning "a bull loose in a china shop." We are wondering if conditions of this kind are not quite universal.

We adjourned at 9.30 and enjoyed a most delightful smoker, where we were liberally treated to good music and singing, good cigars, and a buffet lunch served by a body of bright young men that any college might be proud to call its students.

On the morning of January 9th, Dr. Frost read a paper entitled "Fistulus Withers," describing in detail a method now in vogue at the college for this operation.

Dr. Frost was followed by Dr. Udall, who read an exhaustive paper on "Indigestion in Cattle," which was of great interest to the country practitioner.

At 11 o'clock, Dr. H. J. Milks discussed the subject of hog cholera. He spoke of how within the last few years conditions had so changed in our eastern states that particular attention to infectious swine diseases had become very necessary, which in turn has lead up to the necessity of the preparation of hog cholera serum. He wished to have it clearly understood that the value of the serum is confined to the specific disease, hog cholera, and pointed out that the only positive method of diagnosis would be the inoculation of a well pig with virulent blood, but as this is a pretty expensive method of diagnosis, we must in a measure rely on presentations associated with the disease. He enumerated the symptoms which are fairly constant and reliable, and mentioned the pecechia of the kidneys as one of the most constant lesions. He also conceded that when a virulent type of the disease gets into a herd of swine, it is disastrous, as it is not confined to the ones that die immediately, but that the chronic cases are of no value owing to the fact that they do not do well or amount to much, even though they recover, and they remain a source of virus spreaders for such long periods that it is probably better judgment to destroy them at once. He also spoke of how in the acute type some animals die suddenly, developing no positive lesions, and that a post mortem under such conditions may be quite negative.

As to the serum and simultaneous methods, it was his opinion that where the disease is not prevalent and we wish transitory protection, serum alone would seem the safest and sanest, it giving a protective immunity for several weeks. The simultaneous method establishes immunity for life, but it is his judgment that the simultaneous method is best adapted to states where hog cholera is more widespread than in our own, and that

we should ever keep in mind the danger of the virulent blood spreading the disease in free localities. If for any reason the simultaneous method seems warranted, he believes it would be better procedure to first immunize with serum alone, to be followed later by the simultaneous treatment.

We adjourned at noon and the meeting of the various alumni associations took place until one o'clock. A light luncheon was served at one p. m. and we returned to business again at two.

Hon. Calvin J. Huson, Commissioner of Agriculture, was on the program for an address at this time, but, owing to an emergency of great importance which demanded his presence elsewhere, he requested Assistant Commissioner Flanders, of the Agricultural Department, to attend the conference in his stead. Mr. Flanders, who is known as a very happy speaker, discussed the agricultural law and the relation of the veterinary profession to agriculture, and made very clear the operation of the statute and our duties as veterinarians in controlling communicable diseases. He said the magnitude of our calling could be estimated by the fact that one species of the animal kind alone produced in the United States five billion dollars' worth of butter per year, these animals being distributed over five million farms. Mr. Flanders was in good form and was enthusiastically received.

Following Mr. Flanders, Senator Godfrey addressed us in encouraging words for the future of the profession, and congratulated us upon the excellent methods of teaching now in vogue.

Prof. Williams read a paper on "Retained Placenta." Williams-like, he attacked the question from all points and advanced some very good arguments, as well as going minutely into the structure and functions of the uterus and foetal membranes. The very clear manner in which he pointed out the freedom of the foetal membranes from the maternal calyledons during early pregnancy, which allows the expulsion of the foetal membranes and the foetus in all cases of early abortion, say up to four or five months, would seem to us a very good and practical point

to lay before the general practitioner. His contention is that whenever we have retained placenta it is always due to an inflammation which exists prior to the abortion and not after, and that the adhesion of the membrane is occasioned only by the inflammatory processes of the cotyledons incarcerating the chorionic villi. It is unfortunate that time did not allow a discussion on this phase of the question, as it is an important one and we are of the opinion that many would like to have exchanged ideas on the subject.

The last speaker was Dr. John W. Adams, his subject being "Veterinary Dentistry." The way in which Dr. Adams reviewed dental history and the anatomical and histological structures involved in dental work, as well as his expression of good practical ideas, left little to be said upon the subject. Drs. Berns, Williams, Hollingsworth and Gill made some very practical remarks that were appropriate and useful in actual practice, and our friend, Ben Pierce, from Springfield, Mass., explained in no uncertain terms that he had some knowledge of the attention that horses' teeth oftentimes need when honestly applied for the comfort of the animal.

We then adjourned from this most successful conference and reassembled at the New Ithaca Hotel, where we took part in a delightful banquet of the Society of Comparative Medicine and the Association of College Alumni. We are not certain just how many attended, still it seemed as if the dining-room was filled in every nook and corner, and while we were obliged to leave before the function ended, we know from the list of speakers scheduled on the menu cards that many good and witty things were added to this pleasant occasion.

J. F. D.

MARK YOU THIS—THE ARMY AND NAVY JOURNAL
SAYS THE ARMY VETERINARY SERVICE BILL
WILL LIKELY PASS.

The Army and Navy Journal, which is the organ of the army and navy services and of the militia, and knows what it is talk-

ing about, because all the secrets of these services are whispered into its ear, says that there are excellent prospects of "Mr. Hay's veterinary corps bill," as it names it, that is the army veterinary service bill, as we call it, passing this session of congress. Editorially, in its issue of January 3d, it tells us:

"Immediately after the Christmas holidays the House Committee on Military Affairs will take up the army appropriation bill and put it in shape to be reported to the House. All hearings have been held, and the committee is now ready to take up the bill section by section. The only new legislation that has received any consideration from the committee up to this time is Chairman Hay's veterinary corps bill. It has been practically decided to report this measure out at the first session of the committee after the holidays that it can receive early consideration by the Senate. An effort will be made to pass it at an early date through the House, as there is considerable sentiment for the bill outside of the army, and there are excellent prospects of its being passed at this session."—(*Army and Navy Journal*, Jan. 3, 1914.)

This news makes us rosy with gratification coming from *The Army and Navy Journal*, which more than "has its ear to the ground": it is linked in arms with the War Department and knows, barring political accidents, just what army legislation is going through and which is going to be "Bristowed"; that is, which is to be given a dose of the political prussic acid which will end it. All, absolutely all, official information concerning the army and navy, which it is possible to make public without a breach of *l'esc majeste*, meaning the sin of publishing official information ahead of time, is to be found in its columns. Invariably it knows which way the wind is blowing for army legislation, for its articles are submitted to the War Department for censorship, if there is any doubt of their offensiveness to the Department, and in all ways it endeavors to publish facts about the Department as they are, or as they are to be. The statements of *The Army and Navy Journal*, when it comes to army legislation, are dependable. It would not have published the editorial

note we have quoted, unless it knew that there was something behind its words.

Remember, too, that what is gazetted in the columns of *The Army and Navy Journal* is read by every army officer, wherever he may be, sooner or later, and that its utterances are taken as gospel. Such scrutiny of its columns by military men, as it knows takes place, makes it know whereof it speaks before it puts anything into cold type. Hence it is conservative to the very verge of stiffness and obduracy. Every veterinarian in the country knows that the army officers, taken as a majority, have never had an embarrassing fondness for the veterinary profession. Consequently there has never been a time when *The Army and Navy Journal* has burdened its conservative files with proposals for improvement of the veterinary service of the army; for it reflects every hue and shade of thought in the army service and knows that the average army officer did not take proposals for veterinary legislation seriously. Moreover, it has always published the news of the transfers from one regiment to another, from one part of the country to another, from one detail to another, of every commissioned and non-commissioned officer mentioned in army orders; but never so much as a word came out on orders for veterinarians.

Why, then, this change of front on the part of "our esteemed contemporary," to use the cant of newspaperdom? The reason is because it has learned that the plea of the veterinary profession for its rights in the army has found favor with the present administration. It has been told the lay of the land and knows that the veterinary profession has found favor with the present government leaders in the Senate and House and in the War Department itself; yea, can reach the White House, through its friends in the President's cabinet and through intimate friends belonging to his Princeton University lifelong relationships. No longer is the veterinary profession to be roughly pushed aside and sniffed at. There is indeed meat and meaning in the announcement in the quoted remarks of this newspaper of the army and navy services.

Look at that quotation. Read it again. It says, towards the close, "there is considerable sentiment for the bill outside of the army." That harks back to what the profession did for the army veterinary service bill in the last session of congress, and refers particularly to the furor of our agitation, that of our friends and the friends of our friends, in favor of the bill. This statement of *The Army and Navy Journal* is proof positive that our drive was an iron drive and that at last we have hit the mark. Even the conservative *Army and Navy Journal* expresses as news the fact that our agitation has been effective in Washington. Gleeful news, isn't it?

What has been quoted in the beginning of this article is unquestionably true. But the excellent prospects for "Mr. Hay's veterinary corps bill" (H. R. 4541) may be negated by our inertia and here this legislation is fraught with the greatest danger. Do not forget that the personal touch is the influence which is most powerful. If you personally know a senator or representative to congress, or have a dear personal friend who knows him, reach him through this personal touch by speaking to him or writing to him about H. R. 4541, which is the official designation of the bill aiming to commission veterinarians in the U. S. army. There are about a hundred new representatives in the present congress, and missionary work is needed that they may be schooled in our deserts. The senators need even more attention. The man who knows Senator — or Congressman — is the man who can reach him. H. R. 4541 is the bill to be spoken of. Your personal touch is the winning hand which brings the senator or representative to the proper attitude towards this legislation.

G. S.

THE LOBECK BILL.

We are pleased to direct attention to the Classification Bill introduced into the House by Congressman Lobeck, of Nebraska, on November 14, 1913, published on page 653 of this issue.

This bill benefits all employees of the B. A. I. service, but as the REVIEW is especially interested in the veterinarians in the service, we will only comment on that part of the bill which affects them.

It provides that the entrance salary of veterinary inspectors shall be \$1,400 per annum; and that those who at the date of July 1, 1914, may be receiving a salary of less than \$2,400 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their salaries shall amount to \$2,400; further increase in salary to be made at the discretion of the Secretary of Agriculture. This seems very encouraging for our brothers in the B. A. I. service, and the benefits that will accrue to the Federal Government, through an increased interest that will be created in those now in its employ, and the attraction to that branch of the Federal veterinary service, of men of the first quality, will repay the increased expenditure manifold, should this bill become a law. It therefore behooves every member of the profession throughout the country to use his influence for the passage of this bill by the same congress that will make the Army Veterinary Bill a law. Thereby placing all the veterinarians in the Federal service on a better footing and increasing the efficiency of the services they render to the Government.

OFFICIAL TOUR OF EUROPE OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.

This official tour of the A. V. M. A. to attend the tenth international veterinary congress in London, August 3 to 8, 1914, under the direction of Dr. Adolph Eichhorn, is attracting very general attention amongst the members of the American Veterinary Medical Association, their families and friends; and it would seem from the present outlook that a very large body of Americans would make the tour and arrive in London to attend the congress. A copy of the itinerary and cost of tour was published in the August, 1913, issue of the REVIEW (price there given as \$505 should be \$595, as corrected in September) and can

be referred to in that issue; or a copy of the itinerary can be obtained by writing Dr. Eichhorn, Bureau of Animal Industry, Department of Agriculture, Washington, D. C., Dr. C. J. Marshall, 39th street and Woodland avenue, Philadelphia, Pa., or the Bureau of University Travel, Trinity place, Boston, Mass. The prospect of a summer spent in such a pleasant and educational manner is sweet to contemplate, and for all those who can look forward to such an enlivening prospect, we urge to complete their arrangements with the business management whose arrangements for your accommodations are awaiting your decision. And those who decide late may find that they can no longer be booked. Do not let that be *your* fate.

THE HORSES WON.—The following happened a short time ago in Boston: Mr. A. wanted to sell Mr. B. a five-ton auto-truck. Mr. B. said, "If your auto-truck can do as much as my span of horses, and do it at less expense, I'll buy it, but you must prove that it can." Just at this time Mr. B. had a large shipment of butter arrive which must be transported from the freight depot to North Market street. Team and auto-truck started in at the same hour and worked all day. The team delivered five tons more during the same time than the truck, in spite of the fact that the truck had one more man.

Mr. A. asked for a second day's trial. This was granted, only Mr. B. said, "I must have the same number of men on my team that you have on your truck." Agreed. That day the team delivered ten tons more than the auto-truck.

If any one questions these statements we shall be glad to furnish names, dates and witnesses. Also the name of a prominent firm in Boston that bought two handsome delivery cars at \$3,000 each. After an experience sufficient to determine their value the order was given to sell them and replace them with horses. One sold for \$125, and the other for \$100. When asked why the effort was not made to get more for them, the answer was given, "We grew so sick of having these in the shop when we wanted them that we were glad to get rid of them at any price, and have something we could depend on."

We only mention these two cases out of others that have come under our personal observation to confirm our claim that the horse is not yet in any danger of becoming a memory of the past.—(*Our Dumb Animals.*)

ORIGINAL ARTICLES.

STUDIES ON THE VIRUS OF HOG CHOLERA.*†

BY WALTER E. KING, F. W. BAESLACK, AND GEORGE L. HOFFMANN, DETROIT,
MICHIGAN, RESEARCH LABORATORY, PARKE, DAVIS & Co.

Introduction—The terms “filterable virus” and “ultramicroscopic organisms” are frequently used in the descriptions of some 30 important infectious diseases of man and animals. These terms constitute a convenient form of expression, as in certain cases it would otherwise be necessary to state “specific cause unknown.”

Among the important diseases which fall into this class, as enumerated and briefly described by Wolbach,¹ are yellow fever, molluscum contagiosum, denuge fever, verruca vulgaris, trachoma, sand-fly or three-day fever, acute anterior poliomyelitis, measles, typhus fever and scarlet fever, which affect man only; rabies, foot and mouth disease, variola, and vaccinia affect both man and animals; whereas hog cholera, fowl pest, cattle plague, sheep pox, African horse sickness, swamp fever of horses, and Rous's chicken sarcoma are among those affecting animals only. Canine distemper, which Wolbach mentions as being produced by a filterable virus, has been demonstrated by Ferry² to be due to a bacillus termed by him *B. bronchisepticus*.

Since the recognition of the filterability of hog cholera virus by De Schweinitz and Dorset, 1903-1905, very little progress has been made in elucidating the nature of the specific etiological factor involved.

Dinwiddie,³ from a series of carefully planned centrifugation

* Reprinted from the *Journal of Infectious Diseases*, Vol. XII, No. 2, March, 1913.

* Received for publication February 15, 1913.

† Read before the Society of American Bacteriologists, January 2, 1913.

experiments, concludes that the infectious agent involved in hog cholera is more or less closely associated with the red blood corpuscles. Aside from the report of Dinwiddie, the knowledge accumulated in regard to this subject is relatively meager and scattered.

The filterability of a given virus does not preclude the possibility of the presence in that virus of relatively large microorganisms at certain periods, according to the stage of development in their life cycle. Borrel⁴ demonstrated a protozoan, *Michomonas mesnili*, which, during certain stages of its development, would pass through the Berkefeld and Chamberland filters.

Loeffler also has shown that a flagellate belonging to the genus *Bodo* would pass through Berkefeld filters, which were capable of preventing the passage of *B. prodigiosus*, even after an hour's filtration. Thus, filterability cannot be taken as an indication of the size of a given organism, because the passage of organisms through filters depends also on their plasticity and their ability of accommodation to the pores of the filter. In this, the smaller forms of motile parasites differ from bacteria of relatively the same dimensions. It therefore seems possible that some of the filterable viruses causing disease may have a stage in the cycle of their development which is visible under the microscope.

Betegh⁵ of Hungary has succeeded in retaining hog cholera virus by means of the Bechhold ultra-filter. His experiments consisted in the filtration of two different strains of virus and the injection of each of the filtrates into three susceptible pigs. The six pigs remained well and the conclusion was that the virus had remained in the ultra-filter.

In 1910,⁶ a comparative histological study of the blood of normal hogs and cholera-infected animals was conducted. In this work, the blood of hogs suffering from cholera, in comparison with normal blood, was studied in a routine way on the hemocytometer and with the ordinary blood stains, but at the same time much care was exercised in attempting to find any

differences which might indicate the probable nature of the causative factor. Aside from the data obtained relative to the ordinary blood examinations, nothing of note was observed in the specimens of hog cholera blood.

A few months ago a comparative study of normal hog blood and blood from animals suffering from hog cholera was undertaken, in order to determine whether any differences could be detected by means of the dark field method of illumination. A preliminary report⁷ of this work has appeared.

The fresh blood of normal and diseased hogs was collected aseptically in sterile sodium citrate solution and kept in the incubator until the examination was completed. The blood was obtained from the caudal artery after a small portion had been clipped off with a sterile instrument. In this way bacterial contamination was reduced to the minimum.

In the blood of both normal hogs and animals suffering from hog cholera, as in the blood of any animal, many peculiar structures are observable. The blood of normal hogs thus examined on the dark field may show, in addition to the normal structures, a few granular bodies, sometimes a few bacterial cells from possible extraneous contamination and filaments. The latter may assume the form of "dumb bells," "chains," "droplets" or flexible filaments, which by an untrained observer might easily be mistaken for spirochetes. An excellent description of these bodies as well as others found in the blood of normal animals is given by Balfour.⁸

Betegh, in examining the hog lymph and serum respectively, from two animals dead from hog cholera, evidently has mistaken some of these filaments, described by Balfour, for bodies of some possible significance. In his very recent article on ultrafiltration experiments, Betegh⁹ describes, in a rather confused way, his limited dark field findings as follows:

"Series I. January 16, 1912. Animal infected and died with hog cholera under natural conditions. Pathological changes: Typical stratification (button ulcers) in cecum and colon; edematous infiltration along the arteria coronaria cordis;

infiltration in the right apex of lung; disseminated infiltrated areas in the right lung; parenchymatous degeneration of the kidneys; hemorrhagic inflammation of the lymph glands. Diagnosis: Hog cholera. Microscopic findings: Scattered bipolar and other (colon) bacilli in the organs. In the lung lymph beside these, small slightly stained bodies. In the dark field examination, actively motile, massed bodies from 0.3 to 0.5 microns in size are visible, which are strongly light-refractive. Many appear to have a small apophysis. Very often dumb-bell like forms are seen, and further, spirochete-like micro-organisms, which have at each end a light-refracting round knob. Cultural: On alkaline agar these have grown at 37 degrees after 24 hours, many coli, bipolar and bacterial colonies similar to the *B. suis* *stifer*."

"Series II. April 16, 1912. Swine sickened and died under natural conditions. In colon a typical button ulcer of the size of a small coin. Several lentil-sized ulcers at the point of anastomosis of the small intestine into the colon. The mesenteric lymph glands swollen and hemorrhagically inflamed. The apex of both lungs infiltrated, atelectasis. The pleura was weak and covered with pseudo-membranes. Surface of incision of the lungs marbled; beside yellow necrotic groups, different stages of hepatization of partial pneumonia were visible. Diagnosis: Hog cholera. Microscopically with diluted carbol fuchsin solution, numerous, short bacteria, rounded off at both ends, occasionally typically bipolar colored, were visible. With the Giemsa staining, in part, the same form. Numerous 0.3 to 0.5 micron sized, ovoid or round forms were seen, which seemed to arise from a chromatin substance. In colored streak preparation from the button ulcers, intra- and extra-cellular typical spirochetes were seen. Similar bodies were abundantly visible with the dark field in the serum. They were actively motile. Between small dumb-bell shaped forms were seen also spirochete forms."

From the above description it is quite evident that Betegh based his observations on the fallacies to which Balfour has so aptly called attention. In the blood of different species of normal

animals, filaments may be observed which at times closely simulate spirochetes. Most of these "pseudo-spirochetes," as seen in blood on the dark field, present a knobbed appearance at each pole. After one has become accustomed to the appearance of these filaments, one can readily distinguish the lack of motility, in spite of a flexuous distortion, which is assumed as the filaments are carried by a slight current in the fluid of the preparation. These filaments are also lacking in refractibility and are relatively slender in comparison to the spirochetes recognized in this work.

Bacilli are easily recognized in the dark field by the complete rigidity of the cells and, when flagella are present by the characteristic tumbling motion.

Results from the dark field examinations of specimens of blood from some 50 normal hogs indicate that, as a rule, the blood is relatively free from granules. Under ordinary conditions, and with few exceptions, the blood of normal hogs examined has been designated in our notes as "clean." There have



FIG. 1.—Microphotograph of spirochete in blood of Hog 504. India ink preparation.

been some few instances in which the blood of hogs unexposed to cholera, and in apparent normal condition, have shown the presence of numerous granules. The presence of these granules in normal blood, in the majority of cases, has been traced to ruptured leukocytes.

In the specimen of blood from all infected hogs, which have been observed by means of the dark field, a relatively large spirochete has been found. It averages from five to seven microns in length and one micron in width. The body of the organism is flexible and round at its ends. It presents no knobbed appearance at its poles. Actively motile, it revolves about its longitudinal axis. Its motility is undulating in character and its spirals are fixed. A few of these organisms have been observed dividing longitudinally. In one permanent microscopical mount, prepared by india ink fixation, one of these organisms apparently shows a polar flagellum. On the dark field this spirochete is readily distinguished from bacteria on account of its lack of rigidity and its characteristic motility, and from "blood filaments" by its greater refractive properties and characteristic morphology.

This spirochete has not been found in large numbers, in any of the blood preparations. However, in nearly every specimen examined, more than one has been observed and in many cases five or six have been found with little difficulty. As a rule the organisms have been found to be more numerous at the height of the disease. The specimens of blood examined have been diluted in the proportion of about one to ten or fifteen with sterile sodium citrate solution, which factor should be considered in contemplating the number observed in a given positive specimen. Moreover, it is suggested that this organism, when observed as a spirochete form, constitutes only one stage of its development.

Certain types of granules appear to be characteristic of blood from cholera hogs. It usually contains many granules, some very fine, yet more distinct than blood dust, some larger still, and some very distinct, highly refractive bodies. In many specimens of cholera blood were observed innumerable small granules, which were much more definite and distinct in outline than blood dust, and easily differentiated from the whitish, partially refractive granules from ruptured leukocytes and from the more highly refractive and larger bodies composed of débris, bacteria and

filaments. In this work the presence of these granules appeared to be so characteristic of blood from cholera hogs, that it became an invaluable aid in finding the spirochetes. While these particular bodies may be disintegrated blood elements resulting from disease processes, yet it may properly be suggested that some of them may represent certain stages in the life cycle of the spirochete which has been observed.

The majority of the hogs used in these experiments were inoculated with virus which was diluted 1 to 4 with sterile physiologic salt solution and filtered through Berkefeld filters. In the filtrates only a few granules were visible when studied on the dark field.

In this connection it should be mentioned that the majority of the dark field examinations which are included in this work have been checked by each of us. In addition to the above means of controlling the results, specimens of blood were at times collected by an assistant who designated the specimens by symbols. As the daily examinations often included specimens from both normal and diseased animals, the results were put to a practical test, and in no instance did the results from the dark field examinations deviate from the clinical conditions of the animals whose blood was examined. In some instances, as will be shown by the following detailed results, the presence of hog cholera infections was practically detected by the dark field examination before it was known that the animals showed any symptoms of the disease.

It is interesting to note that in 1894 Dr. Theobald Smith¹⁰ submitted the following brief report on "Coarse and Fine Spirilla in the Intestine of a Hog":

"The recently published articles on fine spirilla in the excrement of cholera subjects prompt me to communicate an observation from animal pathology. Early in 1889 I found non-liquefying comma bacilli in small abscesses of the large intestine, in a hog which I have briefly described in this journal. In streak preparations of the same, stained with alkaline methylene blue, I found, besides large quantities of vibrios, also a great

many fine spirilla, of two to three wave-lengths. The wave-lengths of fixed form are about two microns. A preparation, now more than five years old, still shows the tiny spirochete very distinctly. At that time they never appeared again in cultures. Further investigations concerning the presence of this organism in other animals have not been made."

Betegh, in a lecture and demonstration given before the Veterinary Congress at Budapest in May, 1912, called attention to

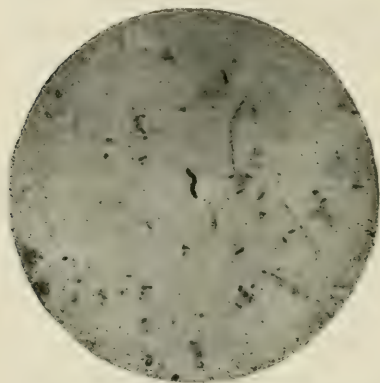


FIG. 2.—Microphotograph, spirochete stained by Giemsa method, from intestinal ulcer of Hog 556.

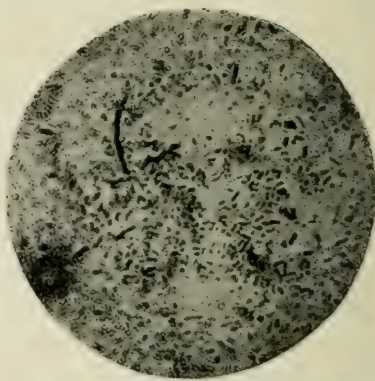


FIG. 3.—Microphotograph of spirochetes in impure culture, from cecal ulcer of Hog 551.

the spirochets which were demonstrable in the ulcers of animals dead from hog cholera.

Little difficulty has been experienced in finding spirochetes in the intestinal ulcers of hogs dead from cholera. In the present work, the ulcers, as found in the cecum of cholera-infected hogs, have been obtained as free from contamination as possible, washed with sterile water, and intermittently scraped with sterile instruments. Portions of the scrapings from the diseased submucosa, after the above treatment, have then been examined on the dark field and in stained preparations, preferably by the Giemsa method. While it thus appears possible to demonstrate spirochetes in hog cholera ulcers with uniformity, yet a large variety of bacterial species of course constitute the flora. With present methods of study, therefore, the recognition of these

spirochetes in the intestinal lesions cannot be taken as of great significance. Whether or not some of these spirochetes in the intestinal lesions bear any relation to those present in the blood of cholera hogs is, of course, an open question. It is possible that the spirochetes found in the blood enter the lymph and blood stream at an early stage of the ulcer formation. This would offer a possible explanation of their comparatively small number as seen on any one blood mount.

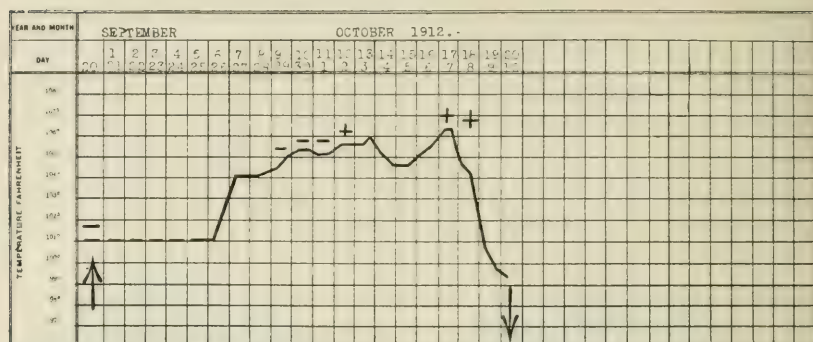
The details of the experiments may be better understood by a study of the following temperature charts and laboratory notes. The temperature charts include the time of inoculation, death or release of each animal, and other necessary data, including brief notations of clinical conditions and changes observed after death. The results of the dark field examinations are indicated by positive and negative signs placed above the temperature curves on the dates when the observations were made. In some instances the presence of granules or freedom of the blood from granules is indicated by abbreviations, gr. (granules) and c. (clean).

B.A.I. strain of virus—The history of the strain of virus, designated in these notes as the "B.A.I. strain of virus," was supplied by Dr. Giltner of the Michigan Agricultural College as follows: "This is a representative of the original strain of Bureau of Animal Industry virus secured by Dr. Marshall at the conference at Ames in May, 1908. We have never kept any other strain of virus in the laboratory for any length of time. Practically all of our serum has been produced on the basis of this virus. It would be possible but very difficult to trace the passages through which this virus has gone since we first began to use it."

Beginning with Hog 446 the blood of practically all animals used in these experiments was carefully examined before inoculation in order to control the results.

Hog 446, inoculated with the B.A.I. strain of virus (Hog 444), manifested symptoms of the acute type of hog cholera after an incubation period of seven days. Three positive findings were made in the blood of this animal.

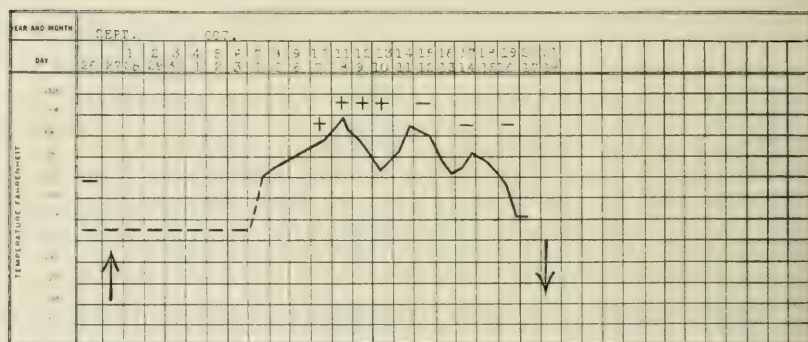
Hog No. 446. B.A.I. STRAIN OF VIRUS.



REMARKS: September 20. Animal inoculated with 3 c.c. from 444 (B.A.I.).
 September 27. Symptoms appeared.
 October 10. Animal moribund, bled and examined.
 Skin on ventral surface of body purple in color; hemorrhagic areas in subcutaneous and muscular tissues. Lymphatic glands enlarged and hemorrhagic. Kidneys show a few petechia, ulcers in cecum.

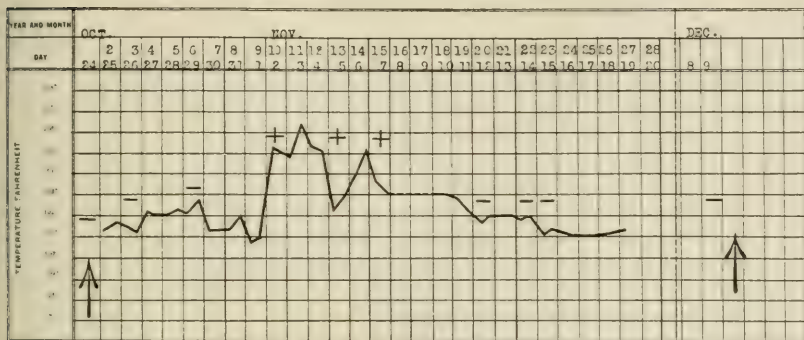
Results from the dark field examinations of the blood of Hogs 453 and 454 afforded most interesting data. Both of these animals recovered after a mild course of the disease following a relatively long period of incubation. As the symptoms

Hog No. 449. B.A.I. STRAIN OF VIRUS.



REMARKS: September 27. Inoculated with 4 c.c. B.A.I. virus.
 October 5. Symptoms appeared.
 October 18. Animal found dead.
 Purple hemorrhagic areas extending over greater portion of body externally and into subcutaneous tissue internally. Lymphatic glands enlarged and hemorrhagic. Ulcers in cecum. Kidneys petechiated. Areas of fatty degeneration in liver, right lung, upper lobe solidified.

HOG No. 453. B.A.I. STRAIN OF VIRUS.

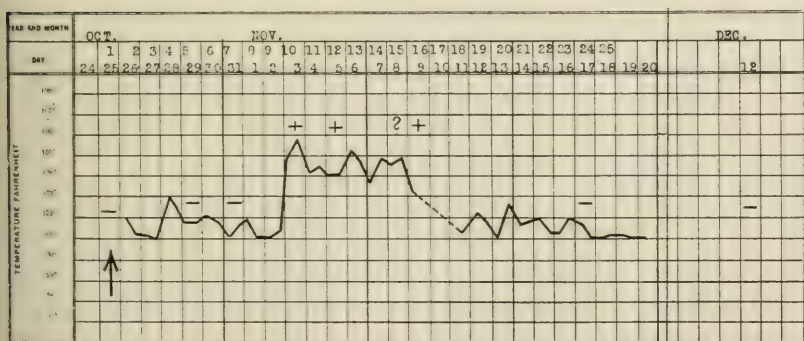


REMARKS: October 24. Inoculated with 4 c.c. B.A.I. (filtered virus, filtered through Berkefeld.
 November 2. Symptoms appeared.
 November 5. Blood positive.
 November 19. Animal recovered.
 December 15. Animal released, immune.

in both animals disappeared, dark field examinations failed to reveal the presence of the spirochete and the numerous characteristic granules. These hogs were kept under observation during a period of one month following recovery and were ultimately released as "immune."

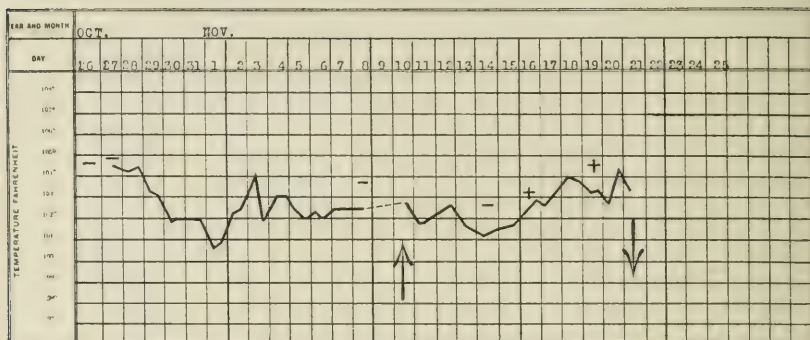
Hog 455 was kept in a separate room in the experimental

HOG No. 454. B.A.I. STRAIN OF VIRUS.



REMARKS: October 25. Inoculated with 4 c.c. B.A.I. virus (unfiltered).
 November 2. Symptoms appeared.
 November 19. Animal recovered.
 December 15. Animal released, immune.

Hog No. 455. B.A.I. OR MICHIGAN (DEMERICK) STRAIN OF VIRUS.



REMARKS: Control. October 28. Appearance of "rash" on abdomen and flanks. Animal eats well and shows no symptoms of cholera. Diagnosed as parasitic skin affection.

November 10. Recovering hogs (not dipped) 446, 447, 448 placed in inclosure with 455.

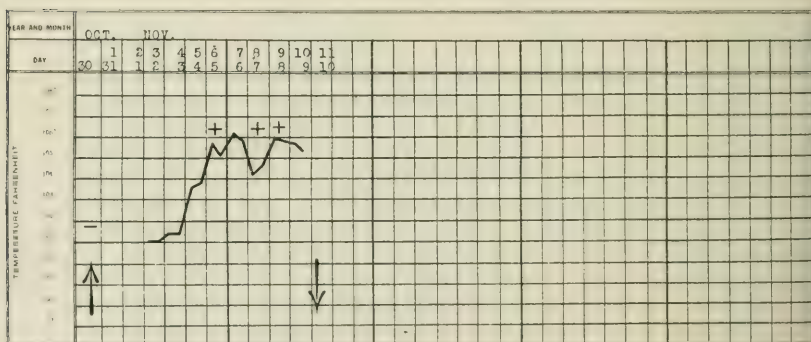
November 16. Animal sick.

November 21. Pig moribund, bled and examined.

Typical lesions in cecum, lymphatic glands, and lungs.

stable from October 26 until November 10 for the purpose of serving as a control on the methods used in isolating the experimental lots of hogs. During a part of this period Hog 455 suffered from a parasitic skin affection, but dark field examinations

Hog No. 506. B.A.I. STRAIN OF VIRUS.



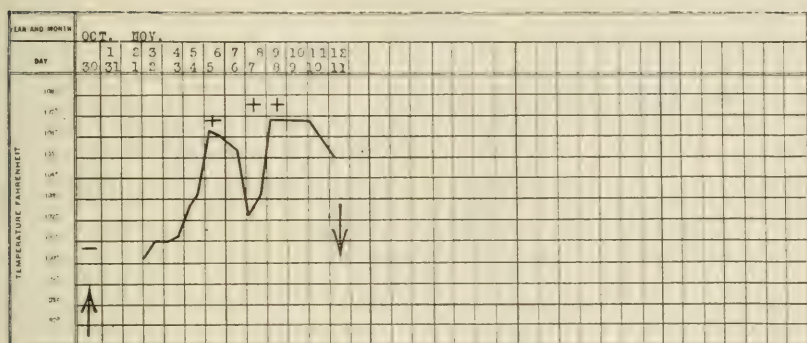
REMARKS: October 30. Inoculated with 4 c.c. B.A.I. virus.

November 4. Symptoms appeared.

November 10. Animal found dead and examined.

Cecum, lymphatic glands, spleen, kidneys, and lungs show typical lesions of cholera.

HOG No 507. B.A.I. STRAIN OF VIRUS.



REMARKS: October 30. Inoculated with 4 c.c. B. A. I. virus.
 November 4. Symptoms appeared.
 November 11. Animal found dead and examined.
 Lymphatic glands, cecum, lungs, kidneys, and spleen show typical lesions.

demonstrated a "clean" blood, free from granules and the spirochete. On November 10 the animal was exposed to the disease and developed symptoms in six days. His blood then showed positive findings and autopsy revealed lesions of cholera.

The charts of Hogs 506 and 507, inoculated with the B.A.I. strain of virus, need no further explanation.

Michigan (Demerick) strain of virus—On September 24, a farm at Roseville, Mich., was visited for the purpose of examining the herd of hogs. Several sick hogs of this herd, which had been isolated, manifested symptoms similar to those of hog cholera—malaise, anorexia, high fever, and diarrhea. A few purple areas were observed on the abdomen and ears.

With the permission of the owner two of the animals were bled from the carotid artery and careful examinations made. Typical lesions of hog cholera were found in the large intestines, lymphatic glands, lungs, kidneys and spleen, and a positive diagnosis of the disease in the acute form was made.

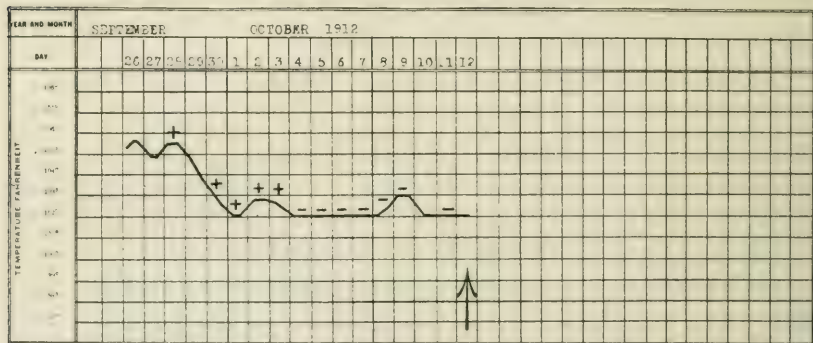
On September 26 two animals affected with hog cholera were brought to the laboratory. The blood of one of these hogs was examined immediately and the spirochetes were found with little difficulty. This animal was moribund, and was bled and ex-

amined on the same day. The other hog, No. 448, ultimately fully recovered from the disease. An examination of the temperature chart of Hog 448 will show the logical results obtained from the study of his blood on the dark field.

Three hogs, Nos. 450, 451 and 452, were inoculated with the Michigan (Demerick) strain of virus. The results of the dark field blood examinations appear in the charts below and were clearly confirmatory of previous findings.

Michigan (Rochester I) strain of virus—On November 9, eight apparently normal pigs were received from Rochester, Mich. No particular notice was taken of these animals as the blood of other hogs suffering from cholera was at the time under close observation. The eight susceptible pigs were received in an isolated pen, at some distance from the experimental stable, and cared for by an attendant who never entered the experimental stable. This was the routine procedure when normal pigs were received.

HOG NO 448. MICHIGAN (DEMERICK) STRAIN OF VIRUS.



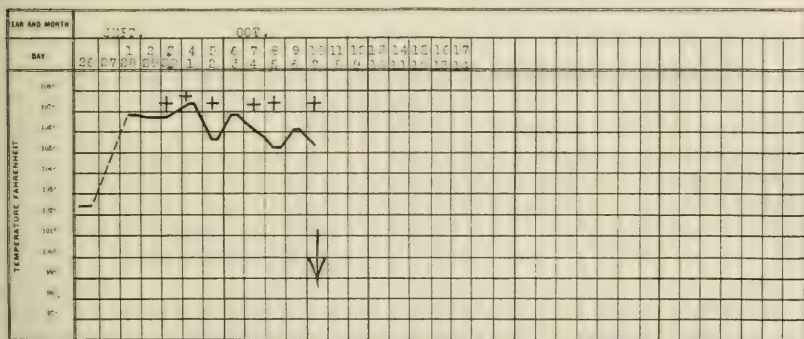
REMARKS: October 12. Animal fully recovered. Released as immune.

On the evening of November 12, Hog 503, one of the eight apparently normal pigs from Rochester, was removed to the experimental stable, inoculated with Michigan (Demerick) strain of virus and placed alone in a disinfected room. In this instance no dark field blood examination was made before inocu-

lation, owing to the lack of time. It was planned that the examination of the blood, for the purpose of control, should be made the next morning following the inoculation. Likewise no temperature observation was made until the next morning. On November 13, the day following the inoculation of Hog 503, the dark field examination of the blood revealed the spirochete. The organism was again found on November 14. At this time the temperature of the animal was 104.2° F. and it showed symptoms of hog cholera. An inspection of the remaining hogs of this lot, which were still in the isolated pen used for receiving susceptible animals, showed that practically all were suffering from the disease. Among the apparent symptoms were diarrhoea, anorexia and listlessness.

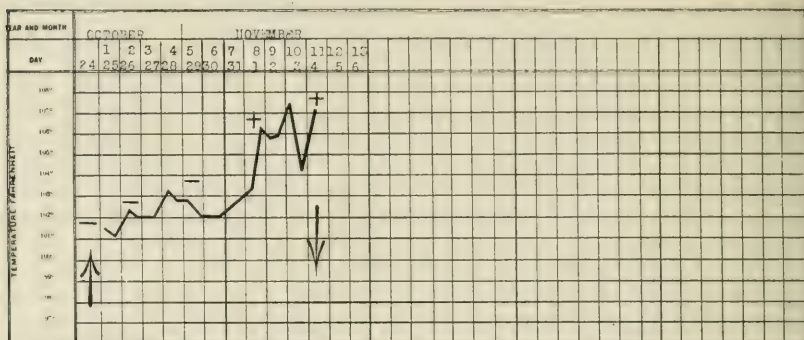
Mechanical error in clinical chart of Hog No. 450—Michigan (Demerick) strain of virus—the animal was inoculated on September 27th; on October 5th symptoms appeared. During the period between September 27th and October 5th no temperatures were taken of this animal and the temperature curve on the chart should begin October 5th and extend until October 14th, when the animal was found dead. The dotted lines should extend from

HOG NO. 450. MICHIGAN (DEMERICK) STRAIN OF VIRUS.



REMARKS: September 27. Animal inoculated with 4 c.c. Demerick virus.
 October 5. Symptoms appeared.
 October 14. Animal found dead and examined.
 Large areas of congestion and hepatization in lower lobes of both lungs, kidneys contain a few petechiae. Spleen enlarged and gorged with blood. Mucosa of large intestine congested. Lymph glands enlarged and hemorrhagic.

Hog No. 451. MICHIGAN (DEMERICK) STRAIN OF VIRUS.

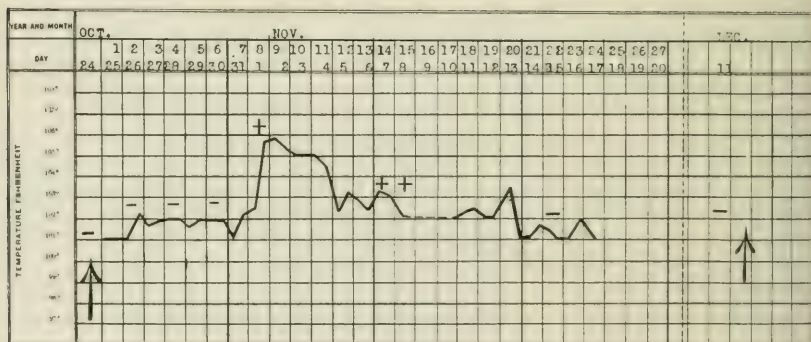


REMARKS: October 24. Demerick virus (filtered through Berkefeld).
 November 1. Symptoms developed.
 November 4. Animal found dead and examined.
 Lesions in lymphatic glands, spleen, lungs, and cecum typical of cholera.

September 26th until October 5th. The error is purely a mechanical one on the part of the individual who drew the graphic representations on the clinical chart.

Careful inquiry was made as to the source of this lot of pigs and it was found that they were purchased from a stock buyer, who had kept them for 10 days previous to receipt, in an en-

Hog No. 452. MICHIGAN (DEMERICK) STRAIN OF VIRUS.



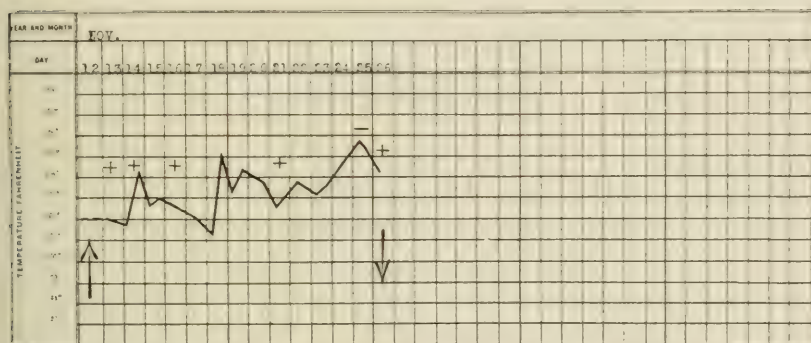
REMARKS: October 24. Inoculated with 5 c.c. of Michigan (Demerick) virus (unfiltered).
 November 1. Symptoms appeared.
 November 17. Animal recovered.
 December 15. Animal released, immune.

closure which received all hogs purchased. Thus, it was clear that these pigs had been subjected to one of the most common methods of exposure to the disease, and that an incubation period of 10 days had elapsed before they were delivered at the laboratory.

In this instance a diagnosis of hog cholera was practically made by means of the dark field.

The autopsy findings in Hog 503, which was bled two weeks after being taken under observation, could not consistently be

HOG No. 503. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



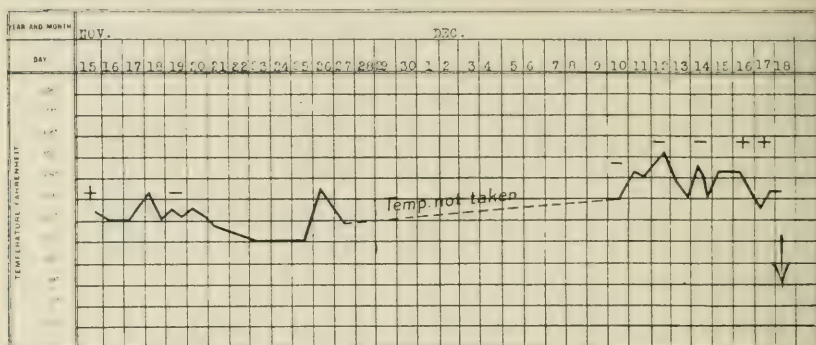
REMARKS: November 12. Inoculated with 4 c.c. virus from Hog 450 Michigan (Demerick) strain.
 November 14. Found pig showing symptoms. One of Rochester hogs.
 November 17. Typical symptoms.
 November 20. Typical symptoms.
 November 26. Animal moribund, bled and examined.
 Lymphatic glands, lungs, kidneys, and heart muscle show typical lesions.

used to verify the diagnosis of cholera in this lot of hogs, because of the fact that this animal had received an inoculation of Michigan (Demerick) strain of virus.

Hog 504 was killed and examined on November 16, after two positive dark field examinations were made. The lesions were not pronounced because of the fact that sufficient time had not elapsed for typical lesions of cholera to develop.

The disease in this lot was of the subacute or chronic type, as is shown by a study of the following charts of Hogs 505, 509,

Hog No. 505. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



REMARKS: November 15. One of Rochester pigs. Not inoculated.
 November 20. Symptoms of chronic type.
 December 10. Animal very weak and emaciated.
 December 19. Hog died on bleeding table.
 Lymphatic glands, heart muscle, lungs, kidneys and cecum show typical lesions of cholera.

510, 511 and 513. The clinical conditions and autopsy findings left no room for doubt as to the nature of the disease.

In further confirmation of the diagnosis of hog cholera in the above animals, when received at the laboratory, attention should be called to the chart of Hog 514. This animal remained in the isolated pen for susceptible hogs at the time the Rochester pigs were received. Hog 514 had been kept for a period of several weeks in the pen for "susceptibles" previous to this time and was in a healthy condition. The animal was not otherwise exposed to the disease, but promptly developed cholera about six days after the Rochester pigs were placed with it. The blood of Hog 514 showed the presence of the spirochete on three different examinations, and autopsy revealed typical lesions of the disease.

REFERENCES:

1. *Boston Med. and Surg. Jour.*, 1912, 167, p. 419.
2. *Jour. Infect. Dis.*, 1911, 8, p. 399.
3. *Bull.*, Arkansas Exp. Sta., 1912, No. 111.
4. *Ann. de l'Inst. Pasteur*, 1903, 17, p. 81.
5. *Ber. thierärztl. Wchnschr.*, 1912, 28, p. 969.
6. King and Wilson, *Bull.*, Kansas Exp. Sta., 1910, No. 171.
7. King and Baeslack, *Jour. Infect. Dis.*, 1913, 12, p. 39.
8. *Fourth Report*, Wellcome Tropical Research Laboratories, 1911, p. 106.
9. *Ber. thierärztl. Wchnschr.*, 1912, 28, p. 972.
10. *Centralbl. f. Bakt.*, 1894, 16, p. 324.

(To be continued in next issue.)

THE CONTROL OF HOG CHOLERA BY SLAUGHTER METHODS.*

BY GEORGE HILTON, CHIEF VETERINARY INSPECTOR, OTTAWA, CAN.

This policy was inaugurated in Canada by Dr. Duncan McEachran more than twenty-six years ago, when preventive inoculation was unknown; and while it has naturally undergone certain changes, its more drastic provisions still prevail, it being found in the opinion of the veterinary authorities in Canada, the best means of combating the sporadic outbreaks with which we are called upon to deal.

As you are quite familiar with this method of controlling infectious diseases, I will not take up the time of this meeting by going into too much detail in dealing with this subject.

A glance at the annual reports of this association indicates that the control of this disease is a very live issue in your country. You have evidently given the question careful consideration, and you have fully discussed the more modern methods of immunization.

Although opinions may differ with regard to the most suitable methods of control, and existing conditions may make any method practicable or impracticable, it is generally admitted that the more drastic the measures the greater the success in reducing the number of outbreaks, and that the disease increases and decreases according to the strictness or laxity of any regulations governing the movement of hogs in infected districts.

In dealing with such a highly infective malady it is essential to obtain the co-operation of those whose interests are concerned, as otherwise the very important secondary factors in the spread of the disease would seriously interfere with control work. It is a very difficult matter indeed to deal with outbreaks in dis-

* Presented to the United States Live Stock Sanitary Association, Chicago, December, 1913.

tracts where the natural immunity of hogs has been overcome by improper feeding and filthy, unsanitary surroundings. Individuals who are content to raise hogs under these conditions are themselves a grave source of danger and require very careful attention.

All possible steps are therefore taken to enlighten the owners with regard to the nature of this disease. Copies of the regulations and hog cholera bulletins are freely distributed, and special care is taken to give clear and definite instructions.

The Canadian hog raisers, after years of education, are becoming accustomed to our methods, and the opposition which formerly existed is now seldom met with.

The necessary authority for adequate action in the enforcement of this policy is fully provided for by the Animal Contagious Diseases Act and the regulations made thereunder. Notification of suspected cases is made compulsory, and failure to report punishable.

We have found that in localities where the disease has been seen outbreaks are reported promptly, as hog owners naturally prefer to realize all they can on their infected stock, and as they are familiar with our regulations they fully appreciate that it is in their best interests to advise the Department directly they suspect the existence of this disease. They are generally very anxious to obtain the services of an inspector with the least possible delay, as they understand that compensation is not paid, under any circumstances, for hogs which succumb to the disease. Little difficulty is, therefore, experienced through owners concealing the disease and disseminating it by shipping hogs from infected farms.

In dealing with an outbreak, an endeavor is made to wall off the infected territory by prohibiting the movement of hogs from adjacent farms. The size of the restricted area naturally varies, according to the nature of the outbreak and the existing conditions.

The most serious outbreak with which we have had to deal occurred some years ago in Western Ontario. The conditions in

the infected territory were exceedingly favorable to the propagation of the disease, and it was necessary to prohibit the movement of hogs in a very large area. As this action seriously interfered with trade conditions, the shipment, under official supervision, of healthy hogs direct to abattoirs was permitted, and proper attention given to the cars in which they were conveyed.

A great deal of difficulty was experienced in controlling this outbreak, but this was finally accomplished and the spread of contagion to outside points prevented. It has since been possible to suppress outbreaks by the formation of infected circles of comparatively small areas.

Premises on which this malady is suspected, as well as adjacent ones, are promptly quarantined and measures taken to establish a diagnosis. Directly this is accomplished, all infected and contact hogs are slaughtered. The carcasses of the hogs which have shown evidences of the disease, together with all debris, are cremated, and when this procedure is impracticable they are covered with lime and deeply buried. The apparently healthy hogs are suitably slaughtered on the owner's premises, the carcasses carefully inspected and a license issued, permitting the removal for sale purposes of any which are considered wholesome. It is, however, not customary to remove the carcasses of hogs which have been in direct contact with those showing symptoms of the disease.

As soon as all carcasses and contact matter have been satisfactorily disposed of, the cleansing and disinfection of the premises is proceeded with; this is done under the supervision of the Veterinary Inspector in charge of the outbreak, and must be performed in a manner entirely satisfactory to him. Cheap, crudely constructed, insanitary hog houses are burned, while proper measures are taken to effectively disinfect the more modern structures. The yards to which hogs have had access are covered with lime and carefully ploughed under, and the trees in the orchards or yards, and fences, are also disinfected from the ground to a suitable height.

No hogs are permitted to be brought onto any farm until a

period of three months has elapsed from the completion of disinfection. At the termination of this period the inspector revisits the premises, makes a careful inspection and if satisfied forwards a recommendation for their release to the head office. Compensation is always withheld until this release is received and honored, and if the inspector's orders have not been carefully followed it is forfeited. Compensation is also forfeited in cases where the owner persists in feeding raw garbage after due warning has been given.

This provision was found necessary owing to the frequency with which outbreaks of this disease occurred in swill fed hogs, where the origin of infection could not be traced to any other source.

A maximum valuation of fifty dollars is allowed for registered pure bred hogs, and fifteen dollars for grades, the value in each case being adjusted by the inspector, whose decision is final.

During the first few years this policy was in force, compensation was paid at the rate of one-third of the appraised value for diseased hogs and three-fourths of the appraised value for healthy contacts. It was found, however, that this method of awarding compensation frequently resulted in friction, as it was often impossible to satisfy the owner that his hogs were actually diseased, unless the post mortem appearances were most pronounced. The necessary measures were therefore taken by Dr. Rutherford to have the Act amended. This was done in 1904, and two-thirds of the appraised value has since been paid for all hogs destroyed whether diseased or in contact, with the exception, of course, of carcasses which are considered suitable for food purposes.

This change has removed a great deal of friction which previously existed, has made the enforcement of the policy more practicable and has enabled the inspectors to gain the confidence of those interested in the hog industry.

I have briefly outlined the procedure generally followed by our field officers, but I would like to add that the strictest precautions are taken to prevent the spread of contagion in any known

manner. The usual measures are, therefore, followed by the inspectors with regard to their wearing apparel. Dogs on infected farms are chained, and steps taken to prevent traffic over contaminated ground.

In addition to the measures already mentioned, it is of course necessary to protect Canadian hogs from infection imported from other countries. A quarantine of thirty days is imposed on all swine imported from the United States, and these animals must be accompanied by a certificate of health from the district in which they originated. Inspectors are employed to superintend the disinfection of stock cars entering the country, as also to enforce our regulation that transit hogs passing through Canada are shipped in cars specially fitted with 10-inch foot-boards. Inspectors are also stationed at important interior traffic points throughout the country to ensure the proper cleansing and disinfection of all stock cars arriving either from your country or any part of Canada. This work is very closely supervised and has been so arranged that stock cars automatically cleansed and disinfected upon arriving at our important centres. Any cars which escape detention at any of these points are quickly caught at some other point, where the inspectors are located, and properly dealt with. Stock yards, chutes and other facilities required for handling hogs receive close attention. Experience has also rendered it necessary to prohibit the drenching with water of transit hogs while in Canada.

The prompt, effective destruction of the virus is of course the keynote of the whole situation. This, as you know, is an exceedingly difficult undertaking, owing to the strong resisting power of the organism outside of the animal body and the uncertainty which exists with regard to the many channels through which it may be carried.

The hog industry in Canada is receiving every consideration by the Federal Government and Provincial legislative bodies, as it has been found that the rapid increase in our population, due largely to the enormous development of our country, has resulted in the demand exceeding the supply. Our national produc-

tion does not meet our requirements, and the price of these animals has consequently attained an unprecedented figure.

All possible measures are therefore taken in our control work to prevent reckless destruction. With this end in view, all marketable hogs in the vicinity of infected centres are slaughtered and their carcasses utilized while fit for food purposes. This procedure assists materially in case an extension of the outbreak occurs, and also diminishes the loss to owners. We have found that an educational campaign is invaluable, and that directly the hog owners realize that their interests are being guarded they are only too willing to follow the advice of our officers. Little difficulty has, therefore, been experienced in reducing to advantage the number of hogs in any district when it is considered advisable to do so.

The number of live hogs in Canada during the past seven years, as shown by the census returns compiled on June 30th of each year, totals 22,040,000. During this period we have destroyed, in the enforcement of this policy, an approximate total of 17,950 diseased and in contact unmarketable hogs for which we have paid in compensation, \$107,260. We have, therefore, destroyed .081 per cent. of the 22,040,000 hogs, or 81 per hundred thousand, and have paid an average price of \$6 per hog. As the maximum compensation paid for grade hogs is \$10, the low average paid per hog, which includes the pure bred animals for which \$33 is allowed, indicates that the majority of the hogs destroyed were immature or of inferior type. If we figure the compensation paid on the total census stock, we find it has cost .48 of a cent, or practically half a cent per hog to protect our hog industry.

The hogs slaughtered yearly in the Dominion for food purposes must, however, not be overlooked. Our meat inspection records show that 8,600,000 hogs have been slaughtered in Government inspected abattoirs in a period of five years and seven months. It is estimated, however, that this service only covers about 50 per cent. of the hogs slaughtered, and it is therefore evident that there has been an approximate total of 17,000,000

slaughtered for food purposes in that period. By extending this period to seven years, we have an estimated total of 21,517,626 hogs slaughtered for food purposes. It will, however, be evident to you that a large percentage of these hogs could not have been included in the census returns. If, therefore, we include 50 per cent. of these animals in our figures, this policy will have cost the Canadian Government one-third of a cent per hog to control this disease.

I have not, of course, taken into consideration the expenditure incurred in the enforcement of this policy, as it is a common one necessitated by the maintenance of an adequate veterinary sanitary force essential to any country for the protection of live stock.

Our yearly returns naturally show considerable fluctuation; there are periods in which the disease breaks out suddenly in widely separated districts and becomes troublesome, and others when it seems to have almost disappeared.

There has been an increase in the number of outbreaks dealt with in the last few years. They, however, have occurred with few exceptions in districts where the disease had not previously been encountered.

Hog cholera broke out almost simultaneously in the vicinities of cities and towns in several provinces of the Dominion in 1911 and 1912, outbreaks occurring for the first time in Saskatchewan and Alberta. A very serious outbreak also occurred in Manitoba, in which province the disease had not been detected since 1889. A most searching investigation was made by experienced officers, who reported that these outbreaks were undoubtedly due to the feeding of raw garbage.

We have, with few exceptions, been able by energetic action to confine outbreaks to the districts in which they originated, as, owing to compulsory notification, prompt attention is as a rule possible.

Although carcasses entering establishments under inspection showing the slightest evidence of hog cholera are condemned by the Federal Meat Inspectors, they have only detected this disease on four occasions during the last five and one-half years.

By this means the possible dissemination of the disease, through feeding pork scraps in garbage, is practically eliminated. As large quantities of the American product are imported into Canada, we are glad to note, in a recent ruling of your bureau, that the same action will now be taken with regard to infected carcasses of animals slaughtered in your Government inspected abattoirs.

The compulsory slaughter and compensation policy has not by any means been a simple undertaking. The public, as you know, do not take kindly to drastic measures, and difficulties have therefore frequently arisen which have required diplomacy and tact. Under Dr. Rutherford's guidance, however, this policy has survived and our experience has shown that it gives an excellent opportunity to effectively dispose of known contact matter, removes the possible carriers, lessens very materially the period of the existence of the contagion and, therefore, enables the conscientious inspector to render the best possible service in eradication.

The conditions in Canada have, fortunately, been suitable for the effective enforcement of these measures, as the outbreaks have not at any time assumed an epizootic aspect.

You will readily understand, however, that in order to retain full control of the situation throughout the Dominion it is necessary to prevent the possible introduction of unauthorized methods of control. The importation, therefore, or manufacture, sale or use of hog cholera serum is prohibited. I can assure you, however, that while the circumstances, peculiar to our country, have necessitated this action, we are watching with a great deal of interest the results published from time to time by the many able and earnest hog cholera research workers in your country.

ONLY TRULY SCIENTIFIC VETERINARY PUBLICATION IN THIS COUNTRY.—An Alabama subscriber says, in renewing his subscription: "The REVIEW is the only truly scientific veterinary publication we have in this country."

HORSE BREEDING IN NEW JERSEY.*

BY M. A. PIERCE, D.V.S., PATERSON, N. J.

Any suggestion relating to improvement in the breeding of horses involves consideration, particularly of the sires in service, inasmuch as such individuals exert their influence through so many breeding matrons. The activities of the Live Stock Commission as the agency in New Jersey for promoting interest and activity in the feeding, breeding and management of live stock have been centered around definite purposes directed to eliminate the mongrel sire and to emphasize the importance of more rigid selection of the females. Our endeavors have been directed along three definite lines:

First: Toward disqualifying from service mongrel or unsound stallions that are lacking in either breeding or individuality or both—beasts that have failed to sire useful or marketable types.

Second: Toward unifying type by selection based on utility within the breed, rather than originating new breeds based on mere fad, fancy, theory or beauty.

Third: Toward organizing breeders' associations and creating live stock shows that will localize interest, stimulate activity, demonstrate principles, and combine efforts directed toward permanent improvement in the breeding, feeding and general management of pure-bred live stock.

The authority for such activity was outlined by the law establishing the Live Stock Commission as follows:

First: To purchase and maintain stallions of the draft and coach type for distribution and use in the several counties of the state through breeders' associations duly organized, which provided dams for breeding that conform to certain fixed standards of excellence.

* Read before the Veterinary Medical Association of New Jersey, at Trenton, January 8, 1914.

Second: To aid in the selection and distribution of breeding sires and dams of other classes of live stock.

Third: To constitute a Stallion Examining and Registration Board.

This system of personal examination of every stallion by the Examining Board has given most excellent results, and does away entirely with the objection always prevailing, more or less, when the stallion owner is permitted to obtain his certificate of soundness from his local veterinarian to be used as a basis for granting a license service certificate. Furthermore, owners of mares as well as the owners of stallions congregate at the place where the examinations are held, and are able to compare the stallions side by side, which inspections prompts the stallion owner to have his animal in the best possible breeding condition throughout the entire season. The Commission makes tours of inspection, and the Secretary's time for the most part is used in mingling with the stallion and mare owners in a united effort to encourage the breeding of mares to stallions closely resembling in type and conformation of that of the mares; and in this way the Commission is able to further pass upon the usefulness of the stallion as a breeding sire. In addition this regular and personal inspection makes it possible to weed out not only the unsound horses, but those whose colts are not uniform or of high order.

New Jersey is a small state, comprising twenty-one counties, and requires approximately fifty examinations by the Board each year, and while the practice might not be feasible in a larger state it seems to me that a state could be divided into sections, and provision made for individual examination by a competent Board of every stallion in the state. The results obtained thus far after five years of inspection and examination are decidedly encouraging.

At the outset many of the stallions were presented before the Board in miserable condition. Not only were many of them unsound, but they were poorly fed, their feet had been badly neglected, they were not accustomed to work or regular exercise, many of them having never been taken from the breeding

stall or yard after entering the stud. During the season of 1909, seventeen per cent. of the stallions examined by the Board were barred from service. During 1910 twenty per cent. were found to be unsound and were refused certificates, while in 1913 only eight and four-tenths per cent. were disqualified, and during this entire period many stallions that were in service previous to the enactment of the law were unsound by the farmers on general principles. Each year the Board has been able to note marked improvement in the general appearance, and the breeding condition of the stallions. Reports from practicing veterinarians in various parts of the state show that they have emasculated an unusually large number of undesirable stallions that were condemned by the farmer himself as not being worthy of presentation before the Board, let alone being used for public service. Further advice from the veterinarians was to the effect that practically all of the stallions that were rejected by the Board were unsexed. The owners presenting their stallions in poor condition were cautioned against repetition of such practice; were given advice as to the proper method of caring for, feeding and managing a breeding stallion, and requested to present the animal before the Board in better condition next year. The Board has been very rigid in the issuing of license service certificates to young stallions, and few owners cared to bother with the stud colt until three years of age if there was any question of not securing a license, due to their failure to qualify as to breeding and individuality, therefore only the very best stud colts were kept for the stud. Statistics were gathered at the time of each inspection to determine the number of mares bred; the service fee charged; whether or not the stallion was regularly worked or exercised; the number of living colts resulting from his previous activities, and the exact location of his field of service in the various counties, and whenever possible a list of the owners' mares bred to a certain stallion were secured to be used as a guide while inspecting the colts sired by this particular stallion. Within a short time information will be at hand suitable for publication giving in tabulated form valuable information relative to the

economy and usefulness of working breeding stallions, and the effect of such exercise on the character and number of the foals sired.

The legislation relative to the registration and licensing of stallions is very popular with the owners of commendable stallions, and enforcement of the law comparatively easy, inasmuch as the Executive Officer has the co-operation of licensed stallion owners, and it is almost impossible for the owner of a mongrel, unsound or disqualified stallion to obtain sufficient patronage, such as will tempt him to violate the law, and suffer the penalty provided for such offense. There was some objection among owners of stallions living in distant parts of the county where the examination was held in the central part of the county; the grievance being that it was a hardship to bring the animals so far for inspection, and the Board has found it advisable to hold two examinations in the larger counties, preferably one in the spring and one in the fall, which has almost entirely done away with the objection mentioned, and the owners are eager to present their charges before the Board.

The mere fact that this public assemblage of breeding stallions is largely attended by owners of mares as well as stallions is a good advertisement for the owner of a sound stallion presented in first-class condition, and likewise undesirable publicity for the owner of unsound or undesirable stallions; for comparison is made with those of superior conformation and more desirable qualities. In a great many instances owners of inferior stallions have had their animals gelded, as they did not care to experience the embarrassment of presenting their inferior stallions along with desirable stallions for official approval. This fact alone more than outwits any objection to the public assemblage of stallions resulting from owners living at a distance; and as the number of stallions increase, additional examination points will be added to the list by the Board.

The present framing of the law designates certain unsoundnesses and diseases that disqualify stallions from service. It is the judgment of the Board that it is equally important that stal-

lions of undesirable conformation, even though they are sound, should likewise be refused a license service certificate; for the presence of such defects as are noted on many of the stallions is far more objectionable than some of the unsoundnesses mentioned in the law that disqualify from service. In many cases the Board was required to issue certificates and commend stallions that were decidedly inferior in conformation and individuality, and possessed of defects that are known to be equally as transmissible as those specified by law; furthermore, such stallions while in service have failed to sire creditable foals. Unfortunately the Board is compelled at this time to license pure-bred or grade stallions that are sound, even though they lack individuality, and it is known that their colts are inferior. It is exceedingly difficult to convince the average farmer that a stallion possessed of the best breeding, and a sire of good colts, is unfit for service due to the presence of a light unsoundness as defined by law, while his neighbor's stallion being free from any of the unsoundnesses mentioned in the law possesses notable defects, is of relatively unknown breeding, and does not possess any commendable breeding points whatsoever, is worthy of a license. Therefore the Board is unanimously of the opinion that authority should be vested such as will enable them to recognize superior individuals of known usefulness, even though their breeding may be relatively unknown, and likewise to refuse a license service certificate to inferior animals regardless of their known breeding. It is doubtful if there is anything gained by defining certain unsoundnesses as disqualifying a stallion from service, for too many times it is a matter of judgment and individual cases require separate decision. The Board should be vested with authority to issue or refuse certificates as their judgment prompts after a careful examination and thorough investigation of each individual case.

As regards the selection of the females it would be safe in asserting that this is one of the big problems facing the eastern horse breeder. With the stallions owned by the state, many of the western bred mares proved to be shy or irregular breed-

ers; others were old and had not raised a colt for several years; while the greater portion of the local bred mares were of the roadster type, and not suited for mating with draft or coach stallions. With such specimens at hand it was easy to question the potency of the sire, especially in sections of the state where draft horse breeding was looked upon with disfavor by those accustomed to breeding for speed and beauty. Owners of such mares were irregular in returning their charges for re-trial or service, and in many cases expected far too much from the stallions in service while others used hasty judgment in condemning his usefulness. The old saying that "a lie will travel a mile, while truth is putting on its boots" must have originated in a horse-breeding district.

The Breeders' Associations were live wires in collecting suitable mares, and in several cases grouped their orders and brought in select individuals of known usefulness from adjoining states. Reports from secretaries show in several instances farmers disposed of three or four misfit roadsters, and purchased in their place two blocky, drafty mares. This exchange enabled them to accomplish far more farm work at much less cost for feed and care; moreover, there is much more pleasure in working two trusty draft mares than in worrying along with three or more light, flighty, nervous roadsters, as is the case when high-spirited animals are hitched to modern farm implements. There is also noted activity among farmers having suitable pasture land in purchasing draft weanlings and fillies, the object being to grow and develop them for breeding purposes under New Jersey conditions.

It is seldom that a single enterprise creates such universal interest and prompts so many followers as is the case with draft-horse breeding in our little state. Several importations of stallions and mares have been made by private breeders since the state's quota of sires arrived, and in other instances where stallions could not be supplied by the state, companies were formed which purchased stallions outright for use in their neighborhood. In addition to this activity among county or neighborhood organizations, individual farmers have purchased high-priced draft

sires for public service or private stud; while in many other sections of the state public-spirited citizens have contributed to the purchase and maintenance fund of imported sires offered for public service at nominal cost in their respective localities.

Nor does such activity subside at the mere instance of purchasing sires for stud purposes. Colt shows are promoted and liberal cash premiums, with appropriate cups or medals offered for the top notchers, with the result that the entries are numerous, the foals well grown, properly fed, and the young stock a real credit to the breeder. Any money over and above the amount needed for the actual maintenance of the stallion collected by the treasurer of the Breeders' Association is offered as premiums for the best colts sired by the stallion in service, while horsemen generally were eager to offer substantial prizes for creditable individuals. It has been said that this plan was paternalistic, and the legislation requiring inspection, examination and registration of stallions was interfering with personal liberties. In my judgment there is no ground for such assertions. Business enterprises of every nature are regulated by laws far more drastic than these proposed destined to eliminate serious drawbacks affecting live stock breeding. Distribution of stallions might not be feasible in a large state where the draft-horse industry is on a footing by itself. However, under the conditions that exist in New Jersey there is every reason to believe that the move was justified, and surely there has been prompt response from the breeders themselves in a united effort to produce the farmer's horse on the farm. Public sentiment strongly favors a continuation of the method of improvement, and I feel sure that steps will be taken at an early date, such as will stimulate activity in the breeding and selection of other classes of live stock as well. There is no room for doubt when consideration is given to the matter of registration and licensing of stallions. No one can deny the fact that it is a means of eliminating from service unsound as well as undesirable stallions, and while there is great room for improvement in the laws thus far enacted regulating live stock breeding, it is evident that forces that work will accomplish beneficial results. There is danger from too much legislation, but education knows no bounds.

THE CONTROL OF GLANDERS IN NEW YORK STATE.*

BY J. F. DEVINE, CONSULTING VETERINARIAN, NEW YORK STATE DEPARTMENT
OF AGRICULTURE.

In submitting the title of my paper to your secretary I advised him that my remarks would be confined principally to the title, since I consider that the history, distribution, cause and pathology of glanders have been sufficiently discussed for the time being, at previous meetings of this association. This paper will therefore be brief, with an attempt to explain the views and policies of our State Department on this subject, and with the hope of soliciting criticisms and aid on this perplexing problem from the able members of this organization.

We have recognized in New York State for some time that glanders was uncomfortably prevalent, both for human and equine safety and life. We have also felt that our knowledge of its dissemination and diagnosis was inadequate to set in force any radical system of control and eradication that would be equitable to the public and the horse owners, particularly where valuable horses are kept in great numbers, such as in New York City. We also recognized the fact that if we could control glanders in these large centers, its eradication in smaller towns and rural districts would be comparatively simple, as most every new outbreak in the latter places was traceable to one of the large cities. Some of the perplexing questions which were ever confronting us were: The accuracy of mallein if it indicated glanders, and does mallein detect all cases of glanders? Here, as in many other things, the efficiency and reliability of the human element were so interwoven with nearly every strand of the entire technique and deductions, that, after all, the findings of the reagent were dependable in every step upon "the man behind the gun," beginning with the selection of the culture and medium and not ending until the inoculation and observation of the equine animal in question were completed. I think we are all pretty well agreed that

* Presented at the meeting of the U. S. Live Stock Sanitary Ass'n, at Chicago, Dec., 1913.

where properly prepared, mallein, carefully and properly applied, positively indicates the presence of glanders, that a carefully conducted post mortem will, in practically every case, substantiate the verdict, and that any carelessness or inefficiency on the part of the one applying the test might make the results worse than useless; but even with the greatest care and skill, we were ever finding cases styled suspicious. These indefinite cases were constantly crippling the advancement of control work, embarrassing officials and honest veterinarians, as well as exasperating horse owners and being pleasing and useful to dishonest dealers and veterinarians.

When mallein had once been used we were not certain how soon the test might be repeated with any reliability, and with the advent of the serological tests the disadvantages of the indefinite results with mallein were lamentably increased, owing to the fact that after a few days following the injection of mallein into the animal body, it, like vaccine, produced or increased certain substances which we speak of as agglutins and anti-bodies, which in turn caused great confusion in the sera findings; and while McNeil, of New York City, states that mallein in a healthy horse will not produce more than a 2 plus complement fixation, but that vaccine is apt to give as complete a fixation as true glanders, still it seemed as if the blood examinations were doomed to lead us into greater darkness. There was still another phase of this problem viewed from economy; that was the proper disposition of the highly suspicious and positive reactors that exhibited no evidence clinically of the disease, it being the opinion of some that nearly every positive reactor, let its physical condition be ever so fine, was always a dangerous animal at some time, and the chances of such animals entirely recovering and forever ceasing to spread virus were highly improbable. I confess that from practical observation I am not entirely converted to this doctrine; but from post-mortem observations I am forced to conclude that, with rare exception, attended with unusual circumstances, it is false economy to delay the destruction of a horse in which glanders has been clearly diagnosed.

After giving all these questions careful consideration, and being encouraged by the advancements made in sera test work, particularly the complement fixation, the Department of Agriculture, in co-operation with the New York City Health Department, decided to make careful observations on the reliability of the complement fixation test, supplementing it with either the ophthalmic or subcutaneous mallein test, or both, and verifying the results where glanders was indicated by post-mortem examination. The errors in technique in both the field and laboratory were carefully watched and checked, with the result that after we had received assurance from the City Health Department that they would adopt a system of licensing all stables in New York City where equine animals are stabled, thereby insuring proper sanitary supervision of all stables and the closing of others as undesirable, as well as establishing a disinfecting corps under official veterinary supervision and the enforcement of the city ordinance of tagging all horses sent to the dead dock, so that in case animals dying from accident or disease other than glanders should be found to be affected with glanders, the stables from which such animals came might be located for further necessary inspection, we felt justified in submitting the following recommendations to the Commissioner of Agriculture:

First: That prompt and positive action be taken in all cases where glanders is clearly diagnosed, and that such animals be promptly destroyed or held under strict quarantine.

Second: That we favored the complement fixation blood test, since after the first few days of infection we believed definite results more constant during the entire course of the disease than with the agglutination, and more certain of detecting all cases of glanders than any other known test, and that where this test indicated a four plus reaction, supplemented by a corroborative ophthalmic reaction, such animals should be considered as positively glandered.

Third: That a capable veterinary pathologist be placed at the dead dock to autopsy all equine animals brought there, for reasons stated above.

Fourth: That both the State Department of Agriculture and the City Health Department co-operatively extend the present method of inspection, by careful examination of all known exposed equine animals in any stable where a glandered animal is found, with a view of determining whether or not such animal or animals are affected with glanders.

Fifth: That every animal so examined shall be identified by a tag, cord with a seal, or any other practical method of satisfactory identification, and that a record be kept of such examination, and that character of examination by both the State and Health Departments, and the reinspection of such animals, be made at such time or times as these departments deem wise or necessary.

Sixth: That this work could be carried on with greater efficiency if the use of mallein and vaccine were restricted, for the present at least, to official veterinarians, or if by others, to be used in co-operation with an official veterinarian.

Seventh: To prohibit the use of vaccine, mallein, or the application of any agent or substance that could act or interfere with the accurate results of mallein or sera-mallein tests, except under official direction.

These recommendations were approved by the Commissioner of Agriculture and have gradually been put in force during the past three months, and while all detail is not as complete as we hope to have it after a little more experience, we were greatly gratified with the report of the special committee of the American Veterinary Association on the detection of glanders, presented at the annual meeting, September 2, 1913, as it substantiated in practically every detail our recommendations and policies. I here quote that report, in part:

"APPEARANCE OF THE REACTION OF THE VARIOUS TESTS AFTER INFECTION.

"Agglutinins reach their appearance in from 4 to 5 days and continue to increase in the early stages of the disease and diminish as the disease becomes chronic.

" Specific amboceptors of the complement fixation test may be demonstrated in from 7 to 10 days in quantities of diagnostic value, and their presence may be demonstrated during the entire course of the disease.

" Subcutaneous mallein test may, as a rule, be relied upon 15 days after infection.

" Ophthalmic mallein test may be relied upon 3 weeks after infection."

" The ophthalmic test not only meets all these requirements, but is without doubt the most convenient diagnostic method at our command.

" Its reliability compares favorably with any of the other available tests.

" The reaction is usually distinct, and doubtful or atypical reactions are rather infrequent.

" The ophthalmic test does not interfere with subsequent serum or other mallein tests if such are deemed necessary.

" The test may be repeated within 24 hours on same or control eye, and final retest in not less than three weeks.

" The ophthalmic test should be recognized by state and federal authorities, since its reliability can no longer be doubted.

" In all atypical and doubtful cases of the ophthalmic test the combined complement fixation and agglutination or subcutaneous mallein tests should be utilized for confirmation. Such a procedure should minimize the failures and assure the best results in the control of the disease in a single stable or in an entire community."

" *Effect of One Test on the Others.* All blood serum tests are influenced in 3 to 6 days after a subcutaneous injection of mallein or any glanders antigen, including glanders vaccines, for a period varying from 6 to 8 weeks following injection of mallein and up to 3 months and even longer following injection of glanders antigen or vaccines. All blood samples therefore should be taken prior to or at the time of the mallein injections.

" The subcutaneous mallein test or injection of glanders antigen and vaccines may influence the ophthalmic mallein test.

The ophthalmic mallein test should therefore be withheld for 30 days after application of the subcutaneous mallein.

"*Control.* In the reduction of glanders all clinical cases should be immediately destroyed. All suspected and exposed animals should be tested and the positive reactors destroyed. The remaining contact horses held under restrictions subject to further test after the expiration of at least 15 days. All infected premises should be thoroughly cleansed and disinfected."

In conclusion I will give you the results of our short experience in this special effort to control glanders, with particular reference to New York City. While I have brought with me data covering details of each animal inspected, I have not incorporated it in this report, since, in my opinion, it would only add to the burden of printing and reading, without adding useful information. I therefore give the summaries, and will be glad to furnish a copy of detail to anyone sufficiently interested to request it.

SUMMARY.

Number horses examined.....	776
Number rejected: As result of examination.....	412
Number re-examined	57
Number rejected as result of re-examination.....	12

Examination—

Number diagnosed by clinical symptoms.....	171 cases
Complement fixation	302 cases
Agglutination test	398 cases
Ophthalmic test	237 cases
Mallein test	293 cases

The four last-mentioned methods were duplicated in practically 400 out of 600 cases where it was necessary to apply tests, until confidence was established in a 4+ blood reaction. Most cases are now unhesitatingly destroyed on a 4+ reaction. The exceptions being where the owner or his veterinarian are not

sufficiently acquainted with the accuracy of the complement fixation test; and perhaps the splendid physical condition of the animal argues against the blood findings. Such cases as well as cases where the blood reaction is indefinite are held in quarantine for further examination either by retaking the blood or supplementing one of the other tests or both. This is comparatively easy under our tagging system.

Re-examination—

Number diagnosed by complement fixation in..	22 cases
Agglutination test in.....	16 cases
Ophthalmic test in.....	4 cases
Mallein test in.....	48 cases

Here again two or more methods were used in some cases.

Results of Post Mortem: Generalized cases, 259; non-generalized cases, 147; no-lesion cases, 3; clinical cases killed and no post-mortem report made, 15.

PERIODICALS RECEIVED AT THE REVIEW OFFICE.

Semi-Monthly Bulletin—Live Stock Sanitary Board (Penn.)
 Bulletin Washington State Agricultural College.
 Canadian Medical Association Journal.
 Quarterly Bulletin—Chicago Veterinary College.
 The Bacterial Therapist.
 The Veterinary Journal (London).
 The Live Stock Journal.
 The Pacific Dairyman.
 Hoards Dairyman.
 Farmers Advocate.
 The Breeder's Gazette.
 The American Journal of Clinical Medicine.
 The Cornell Veterinarian.
 The Philippine Agricultural Review.
 The Agricultural Journal (South Africa).
 The Rider and Driver.
 The Annals of Surgery.

The Veterinary Alumni Quarterly (O. S. U.)
 New York University Calendar (Weekly).
 The Philippine Journal of Science.
 Memoirs of the Department of Agriculture in India (Veterinary Series).
 Proceedings Washington State V. M. A.
 Proceedings Colorado State V. M. A.
 Announcement Kansas City Veterinary College.
 Second Report Commission on Milk Standards, U. S.
 Public Health Service.
 Annual Report Inspector of Animals, Lawrence, Mass.
 Our Dumb Animals.
 Journal of Experimental Medicine (Rockefeller Institute, New York).
 Experiment Station Record, U. S. Dept. Agr.
 Veterinary Notes.
 Expt. Station Report, Massachusetts.

BELIEVES IT GROWS BETTER ALL THE TIME.—A Kentucky subscriber, in renewing, says: "Could not practice without the REVIEW, and I do believe it grows better all the time."

OPERATION FOR INTUSSUSCEPTION OF ILEUM IN COW.*

BY JOHN K. BOSSHARDT, D.V.M., CAMDEN, N. Y.

Definition—Telescoping—Invaginating: Intussusception is a sudden narrowing or closure of the intestinal passage due to telescoping of one part of the intestine into another, which results in a venous stasis of the telescoped parts.

Occurrence: This is not a frequent condition, but it occurs chiefly in cattle and in the dog, rarely in horses.

Etiology: This condition may come about when a portion of the gut contracts somewhat more powerfully than usual, due to some cause or other, and remaining somewhat longer contracted—it slipping into the posterior portion of the bowel that is wider in lumen at the present time. When the circular muscles of the intestinal tube contract, this becomes narrower, but is elongated, and when the longitudinal muscles contract, it becomes wider but shorter.

Since peristalsis is a wave-like motion of the intestines from before backward, brought about by alternating contractions and relaxations of the longitudinal and the circular muscles, some causes favor the entrance of an anterior portion of the gut that is contracted circularly into the next part of the continuous tube contracted longitudinally.

Even in normal peristalsis invagination may occur, but is reduced again if contractions do not continue.

Stationary telescoping occurs only in abnormally active and energetic contractions. Therefore anything influencing peristalsis may influence the occurrence of invagination.

Frozen grass, roots, ice-cold water, intestinal catarrh, enteritis, or the presence of parasites, foreign bodies or intestinal tumors or constrictions. In antiperistalsis the same thing may

* Presented to the Central New York Veterinary Medical Ass'n, at Syracuse, Nov., 1913.

occur, the posterior portion however entering into the anterior one.

Pathogenesis: Whenever a part of a gut enters into another, it necessarily takes along its mesentery. This results in stasis, causing swelling and serosanguinous infiltration of the inclosed parts. Some of the infiltrating liquid passes through the membranes into the intestinal canal and into the space between the serous coverings.

The rapidly increasing venous hyperemia causes intense and sometimes cramp-like contractions of this part, which are manifested by intense pain and may cause the part to invaginate still more.

Peristalsis is increased in the anterior part of the intestines with moderate pain, while in the posterior part it quiets only after the invaginated part has ceased to contract due to paralysis, necrosis or inflammation. Peristalsis will persist in anal parts because the motion is transmitted to it from the part invaginated.

These contractions, even if very weak, will move the serous or bloody exudate into posterior parts.

The intestinal bacteria escaped with the exudate into the abdominal cavity may be the cause for a peritonitis. Toxins may be absorbed into the general system and cause a general inflammatory condition or infection.

It is believed that in a few cases the invaginated parts sloughed off and an recovered.

Anatomical Changes: The invaginated parts form sausage-like, firm, fluctuating, straight or twisted cylinders of blue or bluish-red color and are usually painful upon pressure. Parts may be released with little effort.

Symptoms: Usually sudden, colicky pain, continuous from start to finish, or after pauses, according to the contractions. Kicking with the hind legs at the abdomen, as in strangulations of the bowels. Looking at right flank, laying down and getting up; restlessness, shaking of the head, etc.

Restlessness ceases after 6-12 hours, peristalsis diminishes, animal is not bloated or only moderately so. Feces are passed

only for a few hours after onset and then cease entirely. Straining considerably. Only a few more feces, but considerable mucus or slimy exudate is discharged.

Rectal examination usually reveals a painful, sausage-like mass; rectum is empty, but sticky with slimy discharge. Appetite is entirely wanting, animal soon becomes weak, eyes sink in, and an animal is ganting up rapidly.

The pulse soon rises to 120-130, and peripheral parts become cool. Temperature usually is not high.

Duration: From 6-9 days to 2 weeks. Recovery in some cases where parts slough off if stenosis does not follow.

Diagnosis: Only positive upon findings of a rectal examination. In rare cases the passage of pieces of the gut in the later stage assures diagnosis. Bloody feces mucus or fibrinous discharges in concert with signs of stenosis of the gut and general symptoms only *permit of the suggestion of the condition*. Exploratory laparotomy not dangerous and probably only method for detection.

Differential Diagnosis: Impaction of small intestines of color. Parts are felt hard or doughy, of inelastic consistency, not painful and their surface is uneven. Uterus is of small intestine.

Membranous Enteritis: May reveal thick, painful, elastic loops, but signs of stenosis are absent.

Stenosis due to clotted blood or twist are difficult to diagnose, which however would not matter, since the gravity of conditions are equally serious and procedure the same.

Torsion of uterus in pregnant animal must also be considered.

Operation: Patient may be given chloral hydrate \mathfrak{v} i-ii dissolved in H_2O by mouth, or Fl. Ex. Belladonnæ \mathfrak{v} iii-iv, if standing in stanchion and the light is sufficient. Have at least two men to assist you (their hands ought to be clean).

Instruments: Razor, scalpel and artery forceps; Two pieces of cloth 2 feet long, 2 inches wide; catgut and needles; two pails of hot water and salt, viz., one teaspoonful to one quart; one smaller dish or pitcher; wash-dish and soap and water; one dish

with an antiseptic solution; several clean towels; ropes for hopping or for slip-noose above hock if in stanchion.

Treatment: 1. Operation: (a) Explor. lap; (b) reduction; (c) resection.

2. NaHCO_3 5-25 in H_2O , followed by HCl solution, diluted. Hold hand over anus to prevent CO_2 from escaping.

Proceedings: Prepare field of operation in right flank and make incision 5-6 inches long. Introduce left hand along the mesentery of the double colon backward toward pelvis and palpate for small intestines or for part previously felt by rectum. Grasp it gently and deliver it from the abdominal cavity. Draw apart and examine closely. If necrosis has set in and perforations are present, decide to remove all the affected portion. Squeeze fecal or other contents into the parts intact anteriorly and posteriorly to amputation or resection. Wash the parts with salt solution. Let assistant hold the parts with a towel soaked with warm salt solution. Separate the mesentery posteriorly at the point of resection for about two inches. Then take your narrow strip of cloth or bandage two feet long and tie it around the gut, firm enough to permit no intestinal contents to discharge. Let one assistant then hold the two ends of the cloth. Proceed likewise over anterior part. Then separate the entire mesentery from part to come off, and after that resect the gut. Grasp the mesentery now into a bunch and tie a catgut around so as to hold it together. Have a needle at end of catgut and stitch across to prevent the catgut from coming off.

Now cut the gut to come away about $1\frac{1}{2}$ or 2 inches from where it is tied; clean parts off with salt water and begin sewing the ends together, employing catgut and making Lembert's suture, viz., to bring the serous surfaces together. Be very particular that the sewing is done well and especially at the mesenteric border. Remove cloths and see if any material oozes through. If so, grasp some serous membrane on each side of suture and suture it over. Then suture the mesentery to the dorsal part of the gut, or rather to its serous membrane sleeve. Wash parts clean of blood with salt water and return to abdominal cavity.

Suture peritoneum and muscles with catgut and use silk or other strong sutures for skin.

The passage of feces may occur after 4-6 hours, with gradual return of appetite and recovery.

Guittard, a Frenchman, states that the operation is an every-day affair in his country.

MINNESOTA STATE LIVE STOCK SANITARY BOARD.—At a recent meeting of the Minnesota State Live Stock Breeders Association the secretary of this association, who is at the same time Professor of Animal Husbandry at the State Agricultural College, was, under a new law, elected to membership on the State Live Stock Sanitary Board as official representative of Minnesota Live Stock Breeders. His connection with the State Agricultural College and Experiment Station should result in still closer harmony and co-operation between the three bodies interested and give the sanitary board direct organization with and the backing of both the State Live Stock Breeders Association and the Agricultural College and Experiment Station of the State University.

Dr. M. H. Reynolds has represented the Agricultural College and Experiment Station on this board from its beginning. For several years those who have been especially interested in this work have worked toward harmony and co-operation and there appears to be in Minnesota a very pleasant spirit and unusually satisfactory condition so far as harmonious co-operation between Agricultural College, State Agricultural Society, Live Stock Breeders Association and the State Live Stock Sanitary Board.

This recent move on the part of the Breeders Association must necessarily strengthen the work and further the movement toward harmony and united effort.

SPECIAL COURSE FOR LICENSED VETERINARIANS.—In our December issue, on page 329, we announced a special course at the School of Veterinary Medicine, University of Pennsylvania, under the above heading, and were pleased to learn from a Philadelphia veterinarian on the 8th of January that 79 veterinarians from all over the country had responded to the call, and were at that time taking the course.

BOVINE COCCIDIOSIS.

BY H. B. F. JERVIS, HOULTON, ME.

During the present month, November, a client from some distance came to me with the following tale of woe.

Out of a herd of about seventeen head of cattle, ranging from calves to aged cows, four yearlings had recently died, following an illness of short duration, with dysentery, blood being passed with fluid faeces. At the time of the interview he also had a cow just coming along in precisely the same way as the dead yearlings had, and he was very much afraid that she would not last more than a few days at most. He had made a diagnosis himself after the yearlings had died, viz., Paris green poisoning, he having remembered that early in the fall about a pail and a half of the latter, in solution, had been spilt in the basement of the barn.

On the appearance of identically the same disorder in the cow, which positively had had no access to this basement, he was "up a stump," and began to fear that a neighbor with whom he was on by no means good terms had been poisoning his herd.

I at once thought of coccidiosis and requested him to send me a sample of fresh faeces from the above mentioned cow as soon as he reached home. This he did, the faeces arriving at my office the following morning. On making smears from the fluid faeces, and blood coagula, and shred of mucous, I had no difficulty in finding vast numbers of round and subspherical oocysts of a coccidium.

This left no doubt as to the trouble, viz., "red dysentery," "coccidiosis intestinalis," etc., etc., so well known in certain European countries. To the writer's knowledge, no previous reports of this disease have been made from this quarter of the globe, and in reporting it he has nothing new to bring forth in regard to it but does so purely as a matter of interest.

In regard to the dimensions of the oocysts found in this instance, they ran from 16 to 18 microns in their long diameter, whilst a very few ran to 20 microns.

The writer, in 1909, had the privilege of making a quite extended study of coccidiosis of rabbits, caused by the coccidium *caniculi*, under that eminent scientist, Prof. Sir John M'Fadyean, in London, and from notes taken from lectures by that gentleman we shall draw very fully as to the development of coccidia.

Coccidia.—The coccidia belong to the sub class of sporozoa of protozoa, or unicellular protozoa. They are microscopic bodies, ovoid, round or sub-spherical. One can distinguish in them two poles, one rounded and the other rather flattened at its apex. They are limited by a thick, double contoured envelope, which is somewhat reduced in thickness at the centre of the blunt pole. Inside this envelope are found the contents, which are granular in character and which nearly always fill up the whole interior, with the exception of a space at either pole, which is seemingly filled with a colorless liquid. A nucleus can usually be plainly distinguished. The coccidia found in the intestines are already fertilized female parasites. In appropriate circumstances, after they have been expelled with the faeces, these fertilized female parasites, or oocysts, produce 8 sporozoites in the following manner:

The central contents divide into four bodies which are called sporoblasts. Each sporoblast changes from a round to a hair shape and provides himself with an external resistant envelope, and this becomes a cystospore. Each cystospore develops within its interior two somewhat comma shaped bodies, and these are the sporozoites. The disease is spread by healthy animals taking in with the food oocysts in which the process of sporulation has been completed. When the oocysts reach the intestine, the sporozoites escape from the cystospores, and in virtue of their power of movement they each pick out an epithelial cell, either of the intestine or bile duct. After penetration, each sporozoite rounds itself up and begins to live at the expense of the cells.

The sporozoite has now been turned into a trophozoite. The

trophozoite continues to grow, and its nucleus undergoes repeated division and has now become what is known as a schizont, and its protoplasmic substance falls into as many pieces as there are young nuclei in it.

In this way there is found a variable number of comma-shaped nucleated bodies, not unlike the sporozoites, and they are termed merozoites. The process by which they have been formed is an asexual one, and is called schizogony. The first generation of merozoites, when set free, seek out a new epithelial cell, and repeat the process of schizogony, and this process is repeated in the asexual way for an indefinite number of generations. After a time, some of the merozoites instead of becoming schizonts are set aside to take part in a process of sexual generation, or sporogony. Some of the merozoites develop into oocysts, and while they are undergoing this process they are known as macrogametes. Other merozoites develop into what are called microgametocytes, and these are the large cells, or coccidia, which fall into a multitude of motile bodies known as microgametes, and these correspond to the spermatozoa of the higher animals, and the macrogametes are fertilized by the penetration of one microgamete into them. A microgamete may be found as a motile body in the intestinal contents. It has a body substance which is in the form of a curved rod, and has two long flagella, by the active movements of which it is able to pick out ripe macrogametes.

Historical.—Zurn (1878) was the first who found coccidia in the intestines of a calf. In 1892, Zschokke pointed out the etiology relation between coccidia in the intestines and red dysentery.

The parasite was first discovered by an English doctor by the name of Hake, in 1839, but for a number of years its real nature was not known. They were looked upon by many as the eggs of some worms. In 1842, certain oval parasites of fishes were discovered and called psorosperms, and in 1845 Renak suggested that the objects first discovered by Hake were of the same nature.

Occurrence.—The disease usually occurs during the warm weather, and especially in wet years, though it may be observed

in the fall or even winter. In this region we have had a particularly wet fall.

Symptoms.—The disease begins with diarrhea, and shortly the feces show an admixture with blood and mucous. The feces are fetid and have been described as having a cadaverous odour. Intense tenesmus and even prolapse of the rectum may appear.

The younger the animals, the more fatalities are met with. The animals rapidly fall off in condition, and often die in convulsions. The pulse and temperature gradually rise, the animal shows staggering gait, deeply sunken eyes, and finally dies from prostration.

Course.—The acute course runs from five to ten days, but occasionally an animal dies in twenty-four hours. In mild, favorable cases recurrent attacks are not infrequent, but they usually take a benign course.

Diagnosis.—The occurrence of the disease during the time that animals are pastured, the fact that the majority of animals affected are young, hemorrhagic diarrhea, and rapid emaciation and finally the finding of the oocysts, microscopically, makes the diagnosis easy.

Treatment.—Bring the animals in from pasture and put onto dry feed. Disinfectants such as creolin and lysol have been used and recommended from ages past.

If complete anorexia be present the animals must be drenched with sustaining agents. From a prophylactic point of view the animals must be debarred access to dirty or stagnant water, such as one finds in boggy or marshy land. Healthy animals, at the appearance of the outbreak, should be brought up from the pasture to the barn and fed on dry food. Infective feces can be made sterile by soaking in solution of sulphuric acid. In the seemingly mild cases the administration of eggs beaten up and other demulcent agents tend towards recovery.

LITERATURE CITED.

- Notes from Lectures by M'Fadyean.
Law, Veterinary Med., vol. 2.
Hutyra & Macek, vol. 2.
Walter Jowett, Jour. Comp. Path. & Therapeutics, vol. 24.
Neumann—MacQueen, Parasites, 2d edition.

TETANUS.*

BY DR. M. D. DE TURK, OLEY, PA.

This disease is described as a rigid spasm of the muscles of the body, both voluntary and involuntary.

Etiology.—This disease is caused by a bacillus that is found in the soil, in manure and in dust. This germ is anaerobic, grows only in the absence of oxygen. It produces a powerful nerve poison, which causes the symptoms of tetanus. This germ is drum-stick shaped, with the spore in one end. The germ itself multiplies at the point where it is introduced, but its poison is absorbed, and is carried by the blood to all parts of the body, and thus the nervous system is poisoned. Deep wounds infected by this germ are more dangerous than superficial wounds, because in them the germ is more remote from the oxygen; hence nail pricks, etc., are especially dangerous. Horses with a nervous, excitable disposition are more predisposed than those of a more sluggish nature. The period of incubation of this bacillus is very indefinite, from twenty-four hours to several weeks. All animals are subject to this disease, but it is more common in the horse than in all the other genii put together. Different parts of the body are affected.

It is called *orthotonos* when the whole body is affected, *trismus* when only the masseter muscles are affected, *tetanus laterolis* when one side of the body is affected most, *opisthotonos* when the upper side of body is most affected, *emprosthotonos* when the body is generally affected. *Orthotonos* and *trismus* are usually the most common.

Semeiology.—The attacks may be acute or sub-acute. The first symptoms which attract attention of the owner is difficulty in chewing and swallowing, an extension of the head and protrusion over the inner part of the eye of the membrana nictitans, inability to open the jaws to their full extent, endeavoring to do so will produce great nervous excitability and increased spasm

* Read before the Schuylkill Valley Veterinary Medical Association.

of the muscles of the jaw and neck. The muscles in general usually becoming rigid. The slightest noise or disturbance usually causes the animal to become greatly excited. The tail is usually elevated and held immovable, the bowels become constipated early in the attack. The temperature and pulse are usually not changed. Acute symptoms become rapidly aggravated until in a state of tonic spasm, a cold perspiration breaks out on the body; the breathing becomes painful from the spasm of the muscles used in respiration; the jaws are completely set, eyeballs retracted, lips drawn tight over the teeth, nostrils dilated, and the animal presents a picture of extreme agony. In the latter stages the pulse then becomes quick and hard. In the sub-acute cases the jaws may never become entirely locked; the nervous excitability and rigidity of the muscles are not so great. All the symptoms may gradually increase in severity for a period of ten to fifteen days, and then gradually diminish under judicious treatment:

The *desire* for food and water remains good. When death does occur it comes through one of two channels: *First*, contraction of the heart, causing syncope; *second*, contraction of the muscles of the throat, and he dies from asphyxia. Death *usually* occurs in from two to ten days.

Prognosis.—If the animal is able to eat and drink a little from time to time, and you can keep bowels moving, you may have a recovery, but if all the severe symptoms are present, then you have a stubborn case in hand.

Prevention.—Where a valuable horse has sustained a wound that it is feared may be followed by tetanus, it is well to administer a dose of tetanus antitoxin. This is injected beneath the skin with a hypodermic syringe. A very high degree of protection may in this way be afforded.

Treatment.—From the nature of the case it is easy to see there is no specific. The animal should be placed in a box stall without bedding, as far away as possible from other horses. Place the animal in an outbuilding or shed, where the noise of other animals will not reach him. The attendant must be very

careful and quiet about him to prevent all unnecessary excitement and increase of spasm.

No one but the doctor and attendant should see him, no loud talking, no clubbing, no spectators, can't lay too much stress on this. It may be good policy to place animals in slings. Bear in mind that a horse with tetanus can't recover in the recumbent position.

Medicinal Treatment.—Use such drugs as have a tendency to quiet the nervous system, as belladonna, prussic acid, morphine, ether, chloral-hydrate, lobelia, gelsemium. Cannabis Indica is sometimes given, also carbolic acid. Tetanus antitoxin is also used.

Antitetanic serum and lobeline are sometimes used in traumatic tetanus.

The per cent. of mortality is less in the horse than in man.

Post-Mortem.—To the close observer there is congestion of the neurilemma of the nerve leading from the wound; the vessels of the spinal cord and brain are congested; usually there is an effusion in the arachnoid space. Bacteriologists say they find the germ in the nerve filaments and sometimes in the spinal cord.

Theory of Transfusion or Inoculation.—Serum of a recovered case of lockjaw will sometimes cure a case in its acute stage. This must be administered in doses of from four to sixteen ounces, either in the jugular or peritoneal cavity. The blood is drawn and let coagulate, the serum is drawn off, then warm that and inject into the peritoneal cavity.

In summing up the foregoing: *First*, cleanse the wound thoroughly and cauterize; *second*, place animal in dark box stall, plenty of ventilation, good hygienic treatment and practise quietness. Place animal in slings in the early part of the disease, so he becomes accustomed to the same; *third*, administer nerve sedatives. You may give tetanus antitoxin occasionally. Don't try to do too much. Dark box stall, animals in slings, quietness, with plenty of fresh water and feed on hand and you may have the very best results.

PROPOSED ELIMINATION FROM THE UNITED STATES PHARMACOPOEIA.

By T. B. ROGERS, D.V.S., WOODBURY, N. J.

It may be of interest to veterinarians to know that considerable pressure is being brought upon the Committee of Revision of the Pharmacopoeia, to the end that they remove useless, inert remedies from its pages. To this proposition we must all give unqualified assent. But who shall say what drug is useless or inert?

The veterinarian would certainly regret to see Grindelia, Guaiacum, Phytolacca, Quassia, Uva Ursi, Cerium Oxalate, Monsel's Solution of Iron, Donovan's Solution of Arsenic, Nitrate of Pilocarpine, Basham's Iron Mixture, Brown's Mixture removed from the official list; but these are but a few of a list of more than 200 drugs and their preparations that one physician would cut out.

What would be left of the Pharmacopoeia after the entire medical profession of the United States "had had a lick at it" may be left to the imagination, possibly the cover; still there would be no use for even a cover.

The tendency in certain quarters to restrict our *Materia Medica* is to be regretted. Cocksureness is nowhere more out of place than in medicine.

To infer that the action of a drug as demonstrated upon an animal of experiment, under the influence of one or more potent drugs, will be duplicated when given to an ailing man or animal is eminently unsafe. It is much to be regretted that we cannot practice exclusive physiologic therapeutics with safety. The work of the laboratory is essential; it furnishes short cuts to our knowledge of the action of drugs; it gives us standardized preparations of value, but it leaves much unexplained. The actions of

Colchicum, of Quinia, of Ipecac, of Calomel have not been explained in the laboratory, but worked out clinically with fear and trembling by many generations of observant practitioners.

It would be an undoubted gain if we could adapt the standardized and physiologically tested remedy to the patient's needs with mathematical accuracy, but unfortunately we cannot do so, and until we succeed in eliminating errors of observation on the part of the practitioner, and the personal equation of the patient, there is no prospect of our so doing. In other words, regret it as we may, we must still practice medicine empirically.

It is therefore evident that efforts to limit our *Materia Medica* must be looked upon with distrust, until the eliminators have very much more than their personal opinions to back up their intentions.

In taking leave of this matter we would suggest that at least one veterinarian be added to the Revision Committee, or that we get together and issue a *Veterinary Pharmacopoeia*.

THE STORY IN A NUTSHELL.—A certain storekeeper in a western town was importuned to buy a motor delivery wagon, but, strange to say, he "had taken the precaution of comparing the" so-called "two methods," real horse power and theoretical horse power, and did not fall for the truck agents' "startling arguments."

That same day a customer of the store, with a house free of all incumbrances, came to the owner of the village emporium and borrowed \$1,500 at 6 per cent. per annum; of course mortgaging his house to the merchant, who could afford neither a pleasure nor a business car.

The borrower of the \$1,500 within a few days was riding about with his family in a new automobile. Within three months the owner of the car was carrying a charge account at the store where he formerly paid cash; his purchases had dwindled monthly, and it was apparent that he was laying by no sinking fund to take care of the mortgage. "Ich ga bibble," murmurs the storekeeper as his customer calls daily in his car, which is reducing the cost of living.—(*Nat'l Ass'n Allied Horse Interests*).

REPORTS OF CASES.

ARRESTED DEVELOPMENT OF A TOOTH FANG IN A BITCH DUE TO AN INJURY.*

By W. M. PENDERGAST, V.S., Syracuse, N. Y.

History—Patient, an Irish setter, was brought to the hospital suffering from a fistula of the left superior maxillary region. This bitch was about three years old. When she was about three months old she was bitten by another dog in the left superior maxillary region. The wound did not heal and continued to discharge pus up to the time when she was received at the hospital.

Treatment—The wound was thoroughly cauterized several times and dressed daily with tincture of iodine and chinosol solution, but did not show any improvement. Finally one day, after four or five weeks' treatment, we noticed that the large tooth fang on the left side was missing. This suggested to us that possibly the tooth had been broken off and that the root was diseased.

Decided to operate, and the bitch was placed under anesthesia. An incision was made down to the bone at the afflicted part. Using a small probe, a fistula was discovered running inward and forward, and the probe seemed to strike against a solid object. Removed a piece of bone about one-half inch square and discovered the missing tooth fang firmly imbedded in the bone. The fang was just about natural size and showed signs of necrosis. It was about three-fourths of an inch long. The surrounding bone was cut away and the fang removed. The bone surrounding the fang showed considerable necrosis, and after removing as much of it as possible the wound was dressed with tincture of iodine.

In a few days the wound began to improve and the discharge grew less. The wound was dressed daily with tincture of iodine. The wound had to be scraped two or three times and patient was discharged about three weeks after the operation. I talked with the owner about six months later and he said that the wound had entirely healed.

* Presented to the Central New York Veterinary Medical Association at Syracuse, November, 1913.

INVAGINATION OF THE SMALL INTESTINE IN A DOG.

BY THE SAME.

History—Patient, a large St. Bernard dog, was brought to the office on July 30. This dog had been in the habit of eating out of garbage pails. On July 30 the dog became sick and the owner gave him a strong purgative and emetic. He said the purgative and emetic worked pretty severely on the dog.

Symptoms—On the 29th there was no action from the bowels but animal continued to vomit. When we received him on the 30th he was still vomiting and could not retain any medicine. The animal would lie on its stomach and showed great depression. He did not seem to show any pain at this time. The owner had the dog taken home that night and I was called to see him the following day. He appeared about the same, only weaker, and still continued to vomit. I told the owner there was no hope for him. The dog died that night. The owner said he suffered considerably towards the end.

Post mortem—About a foot of the small intestine was invaginated, and it had the appearance of blood sausage. It required considerable traction to reduce the invagination, owing to the gangrenous condition of the parts.

Conclusion—This invagination was probably caused by the strong emetic and purgative which the owner administered. This is the first case of invagination I have seen in a dog, but I think we would see more of them if we performed more post mortems.

GASTRIC TYMPANY IN A HORSE.

By T. B. HARRIES, V.S., Calgary, Canada.

I was called one day to see a horse which on a cursory examination presented the following symptoms: Horse in acute pain, abdomen greatly distended, eructations of gas from stomach. I did not have my stomach tube with me, so gave, with dose-syringe, drench composed of salicylic acid, spts. ammon. aromatic and aqua. As soon as I had given the drench, the horse plunged forward with his mouth wide open, and appeared to be trying to vomit, but no ingesta was returned. After that he stood quietly with his head hanging down, pulse was imperceptible, and the extremities became quite cold. I thought that a rupture had occurred and that death would ensue, but continued

giving him stimulants. The tympany gradually subsided and the horse was working again in a few days.

DYSTOKIA IN COW—PARAPLEGIA.

BY THE SAME.

On another occasion I was called out to the country to attend to a cow which could not deliver her calf. The history was that she had been in labor several hours. I found the cow lying down, full length, and in a comatose condition. I delivered the calf, which was dead, without much difficulty. Then gave the cow a hypo. of strychnine. Left a few doses of stimulants, with instructions that it be given to her if she seemed able to swallow. I asked the owner to let me know, the next morning, how she was. I expected to hear that she was dead. I went out again next day to see her at the owner's request. I found her looking a good deal better, but still unable to get up, so I pumped her udder full of (sterilized) air, gave her another hypo. of strychnine, and left a few doses of tinct. nux to be given to her. I heard later from the owner that she got up two hours after I left and made an uneventful recovery.

DIVERTICULUM OF THE RECTUM OF PSEUDO-PERINEAL HERNIA.

By CHARLES H. BEERE, M.D.C., Waterbury, Conn.

In writing this I wish to present a case that I could not find a good description of in any of the works that I have at hand.

History—Boston bulldog, age nine years, fat and always around the house, suffered from chronic constipation. By constant straining caused a dilatation of the rectum or diverticulum about one and one-half inches from the anus. It was impossible for the animal to pass fæces.

Operation—Circular incision immediately inside of the anus, pulling out of the dilated portion of the rectum, excising it and sewing the intestine to the anus with twenty-day chromatinized catgut sutures, using round needles.

With careful preparation of the dog before and after the operation this method will be found very satisfactory in this condition.

RUPTURE OF STOMACH IN HORSE CAUSED BY BLOCKING THE OUTLET OF INGESTA IN DE- TERMINING INGESTION.*

By W. L. CLARK, D.V.M., Seneca Falls, N. Y.

Patient was a large gray gelding, weight about 1,300 and in good condition. Client stated that the animal had not been ill, to his knowledge, in over a year. The animal had been fed green corn fodder the night before, and in the morning owner found the horse vomiting. Was called, but before reaching the place the horse had died and the owner wanted a post mortem.

This is what I found: The seat of the rupture was on the "great curvature" and extended nearly the whole length. The lacerations were most extensive in the outer coats and the "mucosa." The edges of the wound were more or less shredded and of a dark violet color from blood extravasation and clots. Some of the ingesta was diffused through the abdominal cavity between the convolutions of the intestines. The pyloric end of the stomach was filled with "bots," as well as about two feet of the duodenum and were so packed in same that nothing could pass.

A PECULIAR CASE OF OBSTETRICS IN COW.

By SAME.

Was called to see large Durham cow with labor pains, so prepared, as you all know, to deliver those parts of the foetus which present themselves at the pelvic inlet.

As it is written, "Seeing is believing, but feeling is the naked truth," so I had the pleasure of feeling and found a very interesting case of "*Schistocormus reflexus*." On entering the pelvic cavity, I found four feet presenting with head, and also some of the viscera of the calf. Taking both front legs off at the knee I delivered calf, and to my astonishment found calf to have only one posterior limb, and where the second posterior limb should have been, there was a front limb perfectly formed; and the posterior portion of his body turned wrong side out.

After antiseptically treating the uterus, I made an examination, and found a sac containing thirty-two hair balls, ranging in size from a walnut to a baseball.

Here is a question I would like to ask: Were these hair balls a piece of the ectoderm of another foetus or of the same foetus?

* Presented to the Central New York Veterinary Medical Association at Syracuse, November, 1913.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

INTUSSUSCEPTION OF THE COECUM IN A HORSE [*Capt. S. Black, A.V.C.*].—Seven-year-old gelding had colic, which, mild at first, gradually increased so that the horse became very violent, plunging and striking with his forefeet. Linseed oil, oil of turpentine and nitrous ether were given and also three repeated doses of chloral hydrate. After an illness of some seventeen hours the animal died. At the post mortem, intussusception of the coecum and a rupture of this organ, about two inches long, close to the ileo-coecal valve were found. The coecum had passed into the lumen of the double colon, being turned completely inside out like the finger of a glove. The coecum was strangulated and of a deep red color. The walls were fully an inch in thickness, due to a yellowish-red infiltration of the connective tissue. The small intestine showed enteritis and in its walls were embedded numerous sclerostomes, which the author thinks were the indirect cause of the trouble, having set up an inflammation which caused abnormal peristalsis, resulting in the coecal intussusception.—(*Vet. Rec.*)

SOME INTERESTING CASES [*Wm. Hepburn, F.R.C.V.S.*].—Under this heading the following were presented at one of the English societies:

I. *Chondroids of the Guttural Pouch.* After an attack of influenza, a gelding had a chronic nasal discharge, which had remained rebellious to all treatment. He had pain and swelling on left parotid region, occasional cough and discharge from both nostrils. After some time the discharge has disappeared, but as the animal was kept under observation, loud breathing was noticed, with also muco-purulent matter thrown from the left nostril. Exploring the guttural pouch with a fine needle, hard concretions were detected. A sharp seton needle was then introduced to penetrate through the membrane and when the finger was introduced and the entrance enlarged, a quantity of chondroids, amounting to about 30 oz., were removed. Daily irriga-

tions of antiseptics and astringents brought about a complete recovery in a short time.—(*Vet. Record and News.*)

2. TUBERCULAR LARYNGEAL TUMOR IN THE HORSE [*By the Same*].—Mare had been ailing for two months and treated for sore throat. Between the parotid glands a mass was felt. Breathing was stertorous. Chest revealed nothing wrong. Prepared for an operation, tracheotomy was about to be performed to relieve difficult breathing. Exploring, a tumor-like formation was detected, dovetailed in between the parotids and adhering to the posterior walls of the guttural pouches. With careful dissection a fleshy-looking tumor was removed, which on being cut into had an appearance not unlike tuberculosis and was found such on microscopic examination. The mare was then destroyed and the post mortem revealed her lungs full of tubercular nodules, as also were the small bowels.—(*Ibid.*)

3. TUBERCULAR BRONCHIAL GLAND FROM TEN WEEKS OLD CALF [*By the Same*].—Born of an apparently healthy cow, she was, when a week old, tied up alongside a cow with pulmonary tuberculosis. When calf was a little older he showed signs of the disease. He was killed, and both lungs proved to be a mass of tubercular nodules, and the bronchial glands were much enlarged.—(*Ibid.*)

SNAKE BITE (?) [*Sydney Smith, Jr.*].—Was it or was it not? asks the writer by his interrogation point.

A cow was turned out and next morning was found lying and had great difficulty to rise; she then moved very stiffly and the left hind quarter of the udder was practically black. The other three quarters were normal. When the cow was taken home, she fell down and did not rise for some days, appearing partially paralyzed. The affected quarter had a hole about half way up the teat, as if it had been punched out and was about the diameter of the ordinary teat opening, which was in the usual place. The cow showed signs of severe systemic disturbance for some days, but eventually got better after the quarter had been injected with chinisol solution. However, the affected quarter became gangrenous, and practically the whole of the gland substance sloughed away, leaving a large cavity to fill. The other quarters never showed any alteration and gave milk as usual. The writer believes the case was one of snake bite, although nothing definite could be traced.—(*Vet. Record.*)

TREATMENT OF POLL EVIL WITHOUT OPERATION [*J. M.*].—A gelding had a bad poll evil. Head very depressed, nose almost touching the ground. The region is much swollen and several fistulas on each side are discharging bloody pus with most offensive odor. As treatment, instead of opening the fistulous tract, thorough cleaning is made with peroxide of hydrogen followed by injections of "Philacogens" of Parke, Davis & Co. After three days the discharge is reduced and the odor almost gone. The treatment was kept up with much improvement. Neglect in carrying it out was followed by slight relapse. More attention is then recommended and the treatment thoroughly applied, when after two more weeks the wounds were all healed, the horse put to work and had no relapse up to the time of writing.—(*Vet. Record.*)

CANKER OF THE FOOT AND ARSENIOUS ACID [*Lieut. J. J. Hildard, A.V.C.*].—Two Australian horses were put under that treatment.

One has a bad forefoot and was very lame—it was a chronic case, which had been twice treated with only partial success. The other had the four feet diseased.

The treatment consisted in the administration of arsenious acid in bolus with an interval of seven to fourteen days between each of the three courses the drug was given. The doses, ten in number, in each case, were given in alternate days, commencing with one gramme and gradually increasing to three. Both cases recovered and no return of the disease. The local treatment was only pressure and dry antiseptic dressing. The treatment lasted about 3½ months for each case.—(*Vet. Rec.*)

EXTENSIVE RUPTURE OF THE STOMACH [*C. Greene, M.R.C.V.S.*].—Foal six or seven months old is ailing. She stood, head hanging down, has no inclination to move, temperature 101.7° F. Pulse and respiration quite normal, no pain apparent, no nasal discharge, no sign of vomiting. Tonics and oil are prescribed. She dies suddenly after a few hours' sickness. Post mortem revealed quantity of gas escaping from the peritoneal cavity and a large quantity of ingesta covering the bowels, amounting to about four gallons. The stomach was ruptured along the great curvature to the extent of fourteen inches and almost empty. The case was unusual, taking into consideration the absence of any symptoms suggesting the stomach trouble, its extent and the amount of ingesta in the peritoneal cavity.—(*Vet. Record.*)

FRENCH REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

ACUTE POLIOMYELITIS IN A MARE [*Dr. Marchand and Prof. G. Petit*].—With the collaboration this case is recorded as rarely observed in equines. It corresponds to the ascending acute paralysis of man or syndrom of Landry as it is also known.

A nine-year-old mare, in good condition, has an imperfect gait forward, motions are jerky and legs carried in abduction. The animal carried the head high and straight on a rather stiff neck. Walking, she seems to have springhalt on her four legs and has a tendency to go to the left. She turns with great difficulty and seems ready to fall. She moves as an animal which has a cap over her head and she seems feeling hesitatingly for her steps. If the right foreleg is raised, she inclines the body to the left and is ready to fall, but standing is more firm, if it is the left foreleg which is raised. Soon the walking becomes staggering. Paralysis is complete on the fourth day of the sickness. The temperature varied between 37.2° , 38.3° , 39.3° . Examination of the blood shows a marked polynucleosis. No microbes of importance, coagulation slow. After eight days of illness the mare died, and the post mortem completed by the histological examination revealed the nature of the case, viz., an acute poliomyelitis.—(*Rec. de Med. Vet.*)

LARYNGO-PHARYNGO-OESOPHAGEAL SPASMS IN HORSES [*J. N. Ries*].—Many morbid conditions are yet far from being entirely explored, says the author, and relates the following:

First Case—Three-year-old gelding had been treated for distemper, and there remained a little difficulty in the deglutition of solids and liquids, some of which are returned by the nostrils. Although the animal is properly treated, the case is not doing well and little by little the horse is emaciated and yet leaving in his manger his ration, partly chewed balls which are left as in the case of a horse with defective dentition. At times the horse takes hold of food, chews it, but when he is about to swallow it, he pulls back in his stall, has a fit of coughing and food is rejected by the mouth or the nose. With liquids it is the same. All manifestations of choking. The temperature is around 39.3° . Feces small and dry. Great functions normal. Nothing is detected about all the apparatuses. It is a case of inanition by dysphagia.

Oesophagotomy is performed and a probang is introduced

with difficulty on account of the contraction of the organ, and secured to the skin to remain in permanence. Through this, artificial feeding is carried out, so well that when three weeks later the horse having pulled the probang out, the prehension and deglutition are performed well and gradually the horse improved.

He seemed about well when, the first time he is taken out, harnessed to an empty cart, he is taken with an acute attack of suffocation, true roaring which threatens his falling. Taken in his stall, after a short time all bad symptoms disappear. After one week's rest, new return to apparent health and return of similar symptoms after a short walk, accompanied this time with a fall on the ground.

New rest of two weeks—new return of the spasm as the animal is taken out, taking place with greatest severity. The horse drops and tracheotomy has to be performed while down. Fifteen minutes after he is eating and looking in perfect health.

A month is allowed for the cicatrization of the tracheotomy wound, and after it is complete a new trial is given, followed by same result and severe spasmodic manifestations.

The horse is destroyed. No lesions could be found at the careful examination of the head and neck.

Second Case—Occurred in a three-and one-half-year-old mare which, having presented similar symptoms to the first case, had oesophagotomy performed, was fed artificially through it, and after three weeks took her food naturally and was well in a month. Sold at a good price, she never had another attack.

Third Case—Ten-year-old mare had same trouble; oesophagotomy with remaining tube brought recovery in a month.

Fourth Case—Three years filly showed similar difficulty of deglutition and other symptoms, but milder. Recovered by simple local treatment round the throat.

Fifth Case—One-year-old colt has shown intermittent roaring and an operation is demanded. Laryngeal hemiplegia is not present, however. Examination of the fauces is about to be made, a twitch is about being applied, when sudden roaring takes place and asphyxia threatens. The animal drops, breathing is stopped; free incision of the trachea and introduction of a tube saves the animal's life. An hour later the colt is eating, and breathing as usual.—(*Rec. de Med. Vet.*)

AUTO-SEROTHERAPY IN VETERINARY OPHTHALMOLOGY [*Dr. PrunEAU, Army Veterinarian*].—This method of treatment in iritis and kerato-conjunctivitis has been recently applied in

human medicine. The writer has resorted to it in a case of periodicophthalmia and obtained excellent results. He has also employed it in conjunctivitis. His technique is as follows:

1. With an aseptic syringe of 20 c.c. draw blood from a superficial vein; transvase it at once in a wide-mouthed sterilized glass vial and cork it hermetically. Place the glass in a cool place.

2. Twelve hours after getting the blood, a sufficient quantity of serum is formed to allow immediate use, if the case is pressing, but it is better to wait twenty-four hours.

When it is to be used, take with an aseptic hypodermic syringe 3 to 4 c.c. of serum. Close the glass immediately to keep its contents for three or four days in a cool place.

3. Anesthesia the eye with 5 or 6 drops of sterilized cocaine solution at 4 p./ and wash it with tepid sterile physiologic serum.

This step is carried out standing or the animal cast according to its condition and the anesthesia.

4. Raise the upper eyelid and introduce the needle of the syringe under the conjunctiva of the bulb, as far as possible from the sclero-corneal limb. Push the fluid slowly in. A small oedema is formed and resorbed in less than twelve hours.

5. Draw the needle quickly and wash the eye with physiologic serum.

A second injection can be renewed twenty-four hours after.—(*Réc. de Med. Vet.*)

UTERINE CYST IN A COW [*M. M. Grimal.*].—This cow has aborted, but the membranes have not been expelled and the writer is called. On entering the vagina to examine the condition of the parts, a fluctuating tumor is detected on the left wall of that cavity. Of little importance, it does no interfere with the process of separating the colytisans. But as the hand is carried further in, it comes in contact with a large mass which occupies the centre of the vagina. It is pushed back in the uterus and at that moment a large quantity of foetal fluids escaped. In the right uterine horn the big mass is found, elongated, flattened from one side to the other, as big as a large melon, about 40 centimetres long, fluctuating and attached to the uterine wall by a thick peduncle. It is a large cyst whose ablation was carried out with the ecrasuer, after being emptied of its contents, a citrine liquid. The small cyst of the vagina was simply punctured. There was no return nor bad sequelæ.—(*Revue Veter.*)

ELECTRARGOL IN TETANUS [*Major Velu, Army Veterinarian*].—When one of his horses is out of sorts, the owner of the one which is the subject in question lets him rest and purges him. It generally works well, but in this case, after the usual rest and purge, he stood with all the symptoms of a marked case of tetanus. An intravenous injection of two doses of serum and chloral rectal injections are followed by violent crisis. An intramuscular injection in the pectoral muscles of 5 c.c. of electrargol is followed by noted relaxation. The injections are continued until six are given, when the animal is in full convalescence and treatment stopped. Too early, as two days later there is severe relapse. It required nine more injections of electrargol to obtain a permanent recovery. It is evident that electrargol is an agent of choice, says the writer, which would have given more efficacious results if it had been given intravenously, or, better yet, by the intra-rachidian way.—(*Rev. Gen. de Med. Vet.*)

CANINE HEMOPOIETIC SERUM WITH HEMORRHAGIC ENTERITIS IN A LIONESS [*C. Roelland*].—Bought a few months previously, she has been in good health for some time, when she ate with less appetite and in three days there is complete refusal of food. Her feces are liquid and yellowish gray in color and with repulsive odor. Belladone, opium and Bismuth gave but little relief, but the day following she passes blood in small red clots. Mustard on the abdomen is added to the treatment. But the bloody diarrhoea continues. There is extreme weakness, loss of flesh is great. The animal is indifferent to the presence of a live pigeon placed in her cage which perches on her chest. Fatal ending is expected. Fifty c.c. of canine serum and 45 centigrammes of sulphate of hordeine are injected subcutaneously, back of the shoulder. The next day the diarrhoea has stopped; there has been no evacuation of blood. The animal is better. Forty c.c. are again administered, followed by 20 later. Then the improvement is marked and the general condition improves; the lioness growls. With gradually increasing rations of new milk, recovery is complete in a few days.—(*Rev. de Pathol. Compare.*)

PYELONEPHRITIS AND CYSTITIS BY GASTRIC FOREIGN BODY IN A COW [*Prof. Douville*].—A cow three years old was sent to the writer, said to be suffering with vesical tumor. Her general appearance is rather satisfactory and she is put under observation. She is tuberculed with negative result. While she is watched, it is noticed that when having lain down she is made to get up, or when the thermometer is introduced in the rectum,

she stretches up as to urinate and expel spasmodically by small jerks about a glassful of urine, yellow, cloudy, muco-glairy and thready. It contains no sugar, no albumin. Left in a glass tube, it gives a deposit containing pus, some hematies and various species of microbes. By vaginal exploration, the miatus is found red, bladder twice as big as normal, and hard. Rectal examination is negative. Original diagnosis is confirmed; vesical tumor complicated with cystitis. After being kept some time the cow is killed and presented the following lesions: Rumens intimately united to the left kidney by fibrous band, 3 centimetres long and about the size of a 2-franc piece in diameter. In its centre is a small canal containing pus. Left kidney is twice its normal size, and on a longitudinal section shows five purulent cysts, two of which communicate with the pelvis. Right kidney is normal. Bladder hypertrophied and, as its mucous membrane shows, the lesions of chronic cystitis complicated with abscess of the vesical wall.

The foreign body, cause of the lesions, could not be found, but it is very likely that it was a sharp or pointed object of very small dimensions, which from the rumen had found its way into the left kidney, through the ureters and the bladder, where it promoted the various suppurative lesions.—(*Rev. Gen. de Méd. Vet.*)

· ABDOMINAL EVENTRATION [*Major Ducher, Army Veterinarian*].—Thirteen-year-old officer's horse is knocked down and hurt by a runaway tram. One of the shafts penetrates immediately back of the last left rib, towards its inferior border, and enters the abdomen. A mass of intestines bulges out, fortunately protected by a thick mesentery which covers it. The whole forms a tumor as big as a man's head, greatly congested. The horse manifests only slight colics. After careful washing with warm physiologic water, vain attempts are made to reduce the eventration and the horse has to be cast. After minute toilette, the intestines are then comparatively easily returned. Muscular ears are nipped off and suture proceeded with in three layers. A deep sero-muscular with catgut, separated stitches, a second muscular with catgut, and finally a third with silk, by stitches close together involving the skin and above two fenestrated drains. A somewhat loose bandage round the body ends the operation. Low liquid diet is prescribed for five days. The drains are taken off after six days. Cicatrization complete in short time, leaving but insignificant trace of the accident.—(*Revue Gen. de Méd. Vet.*)

ROUMANIAN REVIEW.

By PROF. A. LIAUTARD, M.D., V.M.

GOITRE AND ROARING IN HORSE [*Prof. T. Pocnaro*].—Eight-year-old horse has hypertrophied and fibrous thyroid glands forming tumor as big as an orange which surrounds in an incomplete circle the first tracheal rings.

Although conglomerated, the glands are yet united by the narrow isthmus that exist in youth. The thyroid tumor extends upwards towards the larynx, passing over the first tracheal ring and pressing with force against the crico-tracheal ligament and the recurrent nerve—thus narrowing the lumen of the trachea and interfering with the nerve, producing paralysis of the dilator muscles of the larynx. The horse breathes laboriously when at rest and in action severe dyspnea with whistling; roaring is manifested and threatens asphyxia if trotting is carried out for a certain time.

With this exception, the horse shows no other disturbances and seems in perfect condition; he has simply a typical hypertrophy of the thyroid, occasioning roaring, for which a resolute treatment was prescribed, applications of bi-iodide of mercury, and cauterizations. Iodide of potassium and injections of strychnia and administrations of arsenic gave no satisfactory results. —(*Arhiva Veter.*)

ANTE-DIAPHRAGMATIC OESOPHAGEAL JABOT RESEMBLING PULMONARY EMPHYSEMA IN HORSE [*Lieut. C. Th. Nicolau, Army Veter.*].—The horse *Verishor* shows colic, makes vomiting efforts, has gastro-oesophageal spasmodic contractions, with normal temperature, accelerated circulation, jerky, irregular respirations and makes attempts to vomit. After a short time these symptoms subside and the animal is quiet but placed under observation. He is seen standing quiet in his stall and only shows the alarming symptoms at the hour, when feeding time has come and the rations distributed. In fact every time the appetite of the horse is stimulated, the symptoms appear. Hungry, the animal, which neither eats nor drinks, then shows great excitement, tries to swallow what little food or liquid he has grabbed in his mouth, but is taken with violent efforts to vomit and manifests great pain. In the jugular region on the right side the oesophagus, powerfully contracting, forms a cord which appears and disappears. After many struggles, when the horse lays down, gets up, rubs his nose on the ground and so on, breaks out

in perspiration, foams at the mouth and rejects through the nose the liquid or food that he has swallowed. After a few minutes all that condition has subsided, and the animal is quiet with only its jerky respiration.

After some days these symptoms could no longer be produced at will as at first; it seems as if the animal, aware of his inability to eat or drink, had given up the attempt and then refused entirely to take or try to take anything. He died of inanition after ten days of illness.

At the autopsy there was found in the thoracic cavity, on the course of the oesophagus, immediately in front of the anterior face of the diaphragm, a hard dilatation, larger than a child's head, an intra-thoracic oesophageal jabot, weighing 2,680 grammes, and measuring 53 centimetres in its longitudinal axis. It contains a hard mass of green food, obstructing the entrance to the stomach; the oesophagus between the cardia and the jabot being, so to speak, strangulated.—(*Archiv. Veterin.*).

GENITAL ANOMALY IN A DOG [*Prof. G. Udrisky and G. M. Ilesco*].—Six-months-old pup, when urinating, moans and cries. The anomaly of his genitals is peculiar. The sheath, instead of being narrow and elongated, has the form of a vulva. Like the sheath, the penis is situated in the lower part of the perineal region. The penis is only 2 centimeters long and has a penial bone also very reduced. The urethra ends about half the length of the organ and opens in a mucous fold, covered with erosions, causing the pains manifested by the dog when micturating. The penis remains outside the sheath. There was no indication of testicles; perhaps it was a case of true anorchidy. Placed under observation, the animal by its general disposition showed that he belonged to the male sex.—(*Ibid.*)

ANAL IMPERFORATION—ABSENCE OF RECTUM AND OF THE LAST LOOP OF THE COLON—RENAL LYMPHISIS IN A PIG [*Prof. G. Udrisky and G. M. Ilesco*].—This little pig was thirty-five days old. Since birth he has not defecated and the cause has not been detected until he is brought to the writers. His general condition is very poor. Respiration 4, pulse 80, temperature 38.8°, mucous membranes icteric, jaws tightly closed. The operation for imperforated anus is urgent. The cross incision is made at the proper place, the tissues dissected; no extremity of the rectum is found, and the pelvic cavity is so narrow and small that scarcely a grooved directory can be introduced. Lap-

arotomy is decided for the formation of an artificial anus. The abdomen is open in the left inguinal, the peritoneal cavity entered; no rectum is found, nor is the last flexure of the colon. This organ ends by a blunt cul de sac, attached in the right lateral portion of the pelvic cavity. With great difficulty and most delicate dissection the organ is made loose and drawn towards the incision of the abdomen. The fecal matter was removed. It was liquid, thick, yellow greenish in color and had a very offensive odor. The intestine was sewed to the skin and a rubber tube placed in the opening to avoid its flattening, which would prevent the exit of feces. The animal died the day after the operation.

Post Mortem—Peritoneal cavity contained extravasated sero-bloody fluid, hemorrhagic spots on the course of the digestive canal, which was very congested, valvular endocarditis renal symphysis by union of the two kidneys, which are situated in the lumbar region and found on the median line as a semi-lunar mass with normal blood vessels and nerves and two ureters, distinct and opening asymmetrically in the bladder, one reaching it only at the neck near the origin of the urethra.—(*Archiv. Veter.*)

THE MISSOURI VALLEY VETERINARY ASSOCIATION held its semi-annual meeting in Kansas City, January 27-28-29, which was exceptionally interesting and instructive. The hog cholera question, such a vital one in the Middle West, received a very great amount of time and attention. Another important subject in the West that received considerable attention, in which Secretary Mayo, of the A. V. M. A., took an active part, was forage poisoning; particularly as it relates to foodstuffs. Prof. Merillat, of Chicago, was an active factor in the surgical clinic. Details of this great meeting will be given in our next issue.

INFORMATION WANTED.—I desire the correct addresses of the following newly-elected members of the A. V. M. A., whose letters have been returned "Unclaimed" or "Unknown": Dr. George E. Potter, Pittsburgh, Pa.; Dr. Alne Edward Cameron, Regina, Sask.; Dr. John M. Courtright, Easton, Penn.; Dr. Orville E. McKim, New York City; Dr. Bruce Blair, Jersey City, N. J.

PLEASE SEE THAT YOUR ADDRESS IS CORRECT ON THE SECRETARY'S FILE. Give street address or post office box.

N. S. MAYO, *Secretary*,
4753 Ravenswood Park, Chicago, Ill.

CORRESPONDENCE.

A NEW BURSA.

FORT COLLINS, COLO., December 26, 1913.

Editor AMERICAN VETERINARY REVIEW:

DEAR SIR—It seems almost absurd at this time to try to add anything to the anatomy of the suspensory ligament of the horse, but I find a bursa, undescribed in our text-books, occurring with sufficient regularity to be worthy of record.

The bursa in question lies under the branch of the suspensory ligament that leaves the sesamoids to attach itself to the anterior extensor tendon, and the lateral ligament of the fetlock joint is deep to it. It is approximately circular, and its centre is barely a quarter of an inch below the proximal edge of the os suffraginis or first phalanx. It occurs both in fore and hind legs, and on the inside and outside of the joint. I have seen it as small as a dime, and nearly as large as a half-dollar, with the average size of a quarter. In one case of over forty examined, this bursa was absent. There is no mention of the structure in Chauveau, Strangeways, Sisson, McFadyean, or Montané and Bourdelle. No doubt it must have been observed, but dismissed as trivial. However, a penetrative wound would bring synovia, and, not knowing of the bursa, a practitioner would be forced to the diagnosis of open fetlock joint, a very serious error. I feel that no synovial structure in the legs is unimportant. According to the common-sense system of nomenclature, under which you and I, sir, learned our anatomy, this structure will naturally be called the lateral sesamoidean bursa; according to the B. N. A. and their misguided veterinary followers I suppose it will become the collateral sesamoidean bursa.

Yours truly,

A. W. WHITEHOUSE.

Professor of Veterinary Anatomy,
Colorado State Agricultural College.

Branksmere, Barbados, West Indies, Sept. 10, 1913.

To Editor of AMERICAN VETERINARY REVIEW:

DEAR SIR.—As the following clipping from Barbados *Advocate* of this date may be interesting to some of the readers of the REVIEW, I am sending it to you for publication.

I may also add that several kids have been born here from which pure milk was taken when they were only a few weeks old.

I am yours truly, R. A. STOUTE, D.V.S.,
Gov. Vet. Surgeon.

SOMETHING LIKE A RECORD.—Mr. J. A. Jemmott, who is a member of the local Goat Society, reports that in January last his goat, "Brownie," a half-bred Toggenburg, gave him four does and a buck (these are the terms used by "Pegler's Goat Book") for Wallace, the thoroughbred imported by the Society, but now owned by Mr. H. A. Edwards. A few days ago, "Brownie" again dropped four does and a buck also for Wallace. It would be interesting to hear whether there is any local record of prolificness that beats this case.

SOME LEADING ARTICLES FOR OUR NEXT ISSUE.—The Diagnosis of Dourine by Complement Fixation (Mohler and Eichhorn); A Preliminary Report on the Value of Leucocytic Extract from a Therapeutic Standpoint (R. A. Archibald); The Present Status of the Control of Tuberculosis by Vaccination (S. H. Gilliland and C. J. Marshall); The Significance of Pus and Streptococci in Milk (F. H. Slack); Impaction of the Cecum in the Horse (A. T. Gelyard); and several others.

UNITED STATES CIVIL SERVICE EXAMINATION FOR VETERINARIAN, FEBRUARY 4, 1914.—From the register of eligibles resulting from this examination certification will be made to fill vacancies in the position of veterinary inspector in the Bureau of Animal Industry, Department of Agriculture, and vacancies in the Quartermaster Corps, at entrance salaries ranging from \$1,200 to \$1,400 per annum, unless it is found to be in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

This examination is open to all men who are citizens of the United States and who meet the requirements.

Persons who meet the requirements and desire this examination should at once apply to the United States Civil Service Commission, Washington, D. C.

BIBLIOGRAPHY.

IMPERIAL BACTERIOLOGICAL LABORATORY, MUKTESAR, INDIA.

IMPERIAL BACTERIOLOGICAL LABORATORY, MUKTESAR, INDIA. By Major J. D. E. Holmes, M.A., D.Sc., M.R.C.V.S., Imperial Bacteriologist.

A pamphlet describing the Imperial Bacteriological Laboratory at Muktesar, India, its work and products, has recently been issued by Major J. D. E. Holmes, M.A., D.Sc., M.R.C.V.S., imperial bacteriologist and director of the laboratory.

The author became associated with the institution in 1901, when he was appointed assistant bacteriologist, Dr. Lingard, under whose direction the laboratory was inaugurated, being then imperial bacteriologist. On the retirement of Dr. Lingard, in 1907, Major Holmes was appointed imperial bacteriologist.

The work is very interesting, showing, as it does, the high state of perfection attained in the equipment of the laboratory, and in the arrangement of its several divisions in such manner as to carry out the purposes intended, with the greatest degree of safety and efficiency. A particularly attractive feature is the wealth of beautiful photographic illustrations, thirty-three in number, showing, besides several of the officers, the principal buildings with surrounding landscape, and the more important laboratory rooms. The text comprises 47 pages and is divided into five chapters.

Chapter I gives a short history of the laboratory, beginning with the appointment of Dr. Lingard in 1890, when the first step was taken toward providing facilities for the investigation of the diseases of live stock in India. Dr. Lingard's duties were thus defined:

"To investigate diseases of domesticated animals in all provinces in India and to ascertain, as far as possible, by biological research, both in the laboratory and, when necessary, at the place of outbreak, the means for preventing and curing such diseases."

In 1893 the laboratory was removed to its present site at Muktesar, where it has gradually grown in size and importance until, at present, it registers a permanent staff of a score of scientists

and assistants, with numerous attendants, and has 27 chief buildings.

In addition to the regular work of the institution, a course of instruction in tropical veterinary diseases and in serum therapeutics, usually occupying about two months, is given for officers of the army and civil veterinary departments. Each month a class of about six native veterinary graduates is instructed in the methods of serum injection and in the practical application of serums and vaccines. Quarters are provided for members of the staff and for visiting students.

Muktesar is situated at the summit of a hill on the inner Himalayas, at an elevation varying from 7,500 to 7,702 feet, and is 21 miles from the railway terminus at Kathgodam.

The laboratory estate comprises 7,000 acres, about half of which is forest. The main building is two stories high, is constructed of stone and is practically fireproof. All rooms are thoroughly equipped with all necessary apparatus and provided with water, gas and electric light. The walls are lined with glazed tile and the floors laid with marble slabs. The library contains some 3,500 volumes and subscribes to 101 scientific journals.

All the work connected with serum preparation and investigation in anthrax, blackleg and glanders is carried on in their respective out-laboratories to prevent the risk of contamination. Each of these out-laboratories consists of two large rooms; one contains incubators and sterilizers, the other is equipped as a microscopic room.

There is also provided a fully equipped port-mortem house, an operating house consisting of three rooms with modern appliances and a series of barns for the accommodation of animals used in the preparation of serum. Six pastures situated one to two miles from the laboratory provide accommodation for a reserve supply of animals and for animals under observation.

A branch laboratory situated outside Bareilly Cantonment is used for the purpose of carrying on certain investigations during the winter months.

Chapter 3 is devoted to a résumé of the research work done at the laboratory since its foundation, and cites a long list of publications issued as a result.

The investigations cover a large field, including all the important tropical diseases, and deal with etiology, treatment, serum immunization and associated scientific problems.

In chapter 4 the author discusses the practical application of serums and vaccines in combating infectious diseases of live stock

in India, and points out the difficulties encountered in the suppression of epizootics, owing to the prejudices and feelings of the majority of native farmers and the vast areas where segregation and police restriction cannot be imposed.

No direct attempt at the total eradication of any enzootic infectious disease is made, the operations of the Government Veterinary Department being directed only towards the suppression of outbreaks as they occur. The Veterinary Service relies solely on the aid of serums and vaccines, and these can be used only when the owners consent, as measures of segregation and disinfection cannot be imposed without the consent of each individual owner.

Glanders, surra, lymphangitis, epizootica and dourine are the only diseases for the control of which legislative measures are in force; however, the practical demonstrations of the benefits of serum injection in outbreaks of rinderpest, during the past ten years, have caused the use of serum to be accepted without opposition in most districts of India.

Rinderpest is the most prevalent and destructive disease of live stock in India. Hemorrhagic septicemia is also very prevalent and accounts for a large loss of stock. Blackleg and anthrax are more or less confined to certain areas. Glanders is very prevalent throughout India, and mallein is in all suspected cases used for diagnostic purposes. Tuberculosis is not a common disease of live stock in India, and tuberculin is consequently not much in demand.

A successful method of curing surra in horses by means of arsenic and atoxyl has been worked out and instructions regarding the doses and methods of administration are issued from the laboratory.

Chapter 5 takes up individually the various sera and vaccines prepared at the laboratory, giving the method of preparation and the list of instructions sent out with each shipment as a guide to the method of operation and to the fixing of suitable doses. These instructions are quite complete, giving a list of instruments required, dosage under varying conditions, period of time elapsing before immunity is acquired and duration of immunity. Instructions accompanying diagnostic preparations give minute directions for the reading of reactions.

Directions for collecting and packing material for laboratory diagnosis are included in the pamphlet, as numerous specimens are received annually.

As a whole the publication is illuminating in showing the

great amount of work which has been accomplished since the foundation of the laboratory; and the officials who have been connected with the institution deserve well-merited commendation for the high position which the laboratory has attained in the investigation and treatment of diseases of domestic animals.

J. R. M.

A DESCRIPTION OF THE IMPERIAL BACTERIOLOGICAL LABORATORY, MUKTESAR:
ITS WORK AND PRODUCTS.

A DESCRIPTION OF THE IMPERIAL BACTERIOLOGICAL LABORATORY, MUKTESAR: ITS WORK AND PRODUCTS, by Major J. D. E. Holmes, M.A., D.Sc., M.R.C.V.S., Imperial Bacteriologist.

Major J. D. E. Holmes has recently issued an attractive publication giving in detail a description of the Imperial Bacteriological Laboratory, Muktesar: Its work and products. "In 1890 the first step was taken towards providing facilities for the investigations of the diseases of stock in India. Dr. Lingard was appointed as imperial bacteriologist in connection with the laboratory at the College of Science, Poona." His duties were to investigate diseases of domesticated animals in all provinces in India and to ascertain if possible the means for preventing and curing such diseases. In 1893 the laboratory was removed to Muktesar. In 1895 a part of the laboratory and quarters for the bacteriologist and his assistant were completed. It was at this laboratory, in 1896, that Prof. Koch, at the request of the Government of India, visited Muktesar and demonstrated his bile method of inoculation against rinderpest. In 1898 Dr. Lingard was, because of ill-health, forced to take a leave of absence. In 1899 the main building of the laboratory was destroyed by fire. It was promptly rebuilt. The work has continued to grow until at present there are some 27 buildings for different purposes. "A course of instruction in tropical veterinary diseases and in serum therapeutics was commenced for officers of the army and civil veterinary department. A bungalow for their accommodation was built." At present Major Holmes is the imperial bacteriologist, Mr. H. E. Cross, assistant, Dr. P. Hartley is the physiological chemist, and Mr. M. Kriebel, head European laboratory assistant.

This report shows that a small body of men are actively engaged in the effort to solve the problems connected with trop-

ical animal diseases and sanitation. In addition to the diseases peculiar to that climate, they have anthrax, black-leg, septicemia hemorrhagica, glanders and tuberculosis to contend with. They are preparing serums or vaccines for rinderpest, anthrax, hemorrhagic septicemia, black-leg and tetanus. A successful treatment for surra is reported. They also prepare mallein, tuberculin and various other serums.

It is hard for us to understand or appreciate the difficulties with which this group of men have to contend. They are to be congratulated in the advances they have made and the valuable service they are rendering to the people of that country and indirectly to the world at large.

The report contains a large number of illustrations of the buildings and laboratories now in use. V. A. M.

CLINICAL BACTERIOLOGY AND VACCINE-THERAPY.

CLINICAL BACTERIOLOGY AND VACCINE-THERAPY FOR VETERINARY SURGEONS, by William Scott, F.R.C.V.S.; over 200 pages, with 49 illustrations, including 12 plates. Chicago, Alexander Eger, 1913. Price, \$2.50 net.

Clinical Bacteriology and Vaccine-Therapy is surely an attractive title to a veterinarian of the present day. Bacteriology plays an important rôle in modern medicine; no matter whether it is applied to the practice of human or veterinary medicine, and *clinical* bacteriology, or a discussion of the application to practice, attracts the attention of the practitioner, who welcomes a work that has condensed the matter lying between the laboratory and the patient. This is especially welcome to a practitioner when the work emanates from a practitioner, and the work in question is *particularly* welcome to the veterinary practitioner, having emanated from a veterinarian. The value of bacteriology to present-day therapeutics in either branch of medicine is unquestioned, but in its application it would seem that the veterinarian has some advantages over the physician. Not that serum-therapy is any more effectual in the treatment of animals than when applied to human patients, but there is the prejudice on the part of the patient, in the first place, against having a hypodermic needle stuck into them, and secondly of receiving the material (the source of which they are more or less cognizant) into their systems; which prejudice in many instances prevents the physician from getting the full benefit of the treatment for his patient,

and in other instances disbars its application altogether by a refusal on the part of the patient to receive it.

With the veterinarian it is different; if he has the confidence of his client, the latter seldom questions him as to how he will treat the patient. Consequently serum-therapy has developed rapidly, and on broad lines in veterinary medicine. Therefore this work of Mr. Scott, which has for its primary object the making and administration of vaccines, from a veterinarian's standpoint, must be a contribution to veterinary literature that will be gratefully received by veterinarians. Its eighteen chapters deal with The Laboratory; Preparation of Culture Media; Cultivation of Bacteria; Staining Methods and Stains; Identification of Bacteria—General Principles; Glass-Work Requisites and How to Make Them; The Protective Elements of the Blood, Which Protect the Animal Body from Pathogenic Bacteria; Vaccines and Their Modes of Preparation; The Syringe; Phenomena Following Active Immunization by Vaccines; Serums and Their Mode of Preparation; Special Diseases Caused by Specific Bacteria, Which Are Suitable for Treatment by Sero-Vaccine Therapy; Bacterial Diseases Affecting the Cutaneous System; Bacterial Diseases Affecting Synovial Joints; Bacterial Diseases Affecting the Abdominal Organs; Bacterial Diseases Affecting the Circulatory System; Bacterial Diseases Affecting the Nervous System; Diseases of the Respiratory Organs; Swine Fever. In addition there are the matters treated in the appendices. Tuberculosis and swine fever are dealt with more in detail than the other matters, in which all unnecessary detail has been avoided. Neatly bound in black leather back and corners and olive green cloth, the publisher's work being executed in his usual excellent manner, the book is neat in appearance, of convenient size and altogether desirable.

A TEXT-BOOK OF HORSESHOEING.

A TEXT-BOOK OF HORSESHOEING FOR HORSESHOERS AND VETERINARIANS, by A. Lungwitz, former Member of the Royal Saxon Veterinary Commission, late Instructor in the Theory and Practice of Horseshoeing, and Director of the Shoeing School of the Royal Veterinary College in Dresden, Germany; and John W. Adams, Professor of Surgery and Obstetrics, and Lecturer on Shoeing in the Veterinary School, University of Pennsylvania; eleventh edition, with 212 pages and 229 illustrations. Philadelphia and London. J. B. Lippincott Company. Cloth, \$2 net.

The foundation of this excellent work was laid in German, in 1884, by Prof. Anton Lungwitz, at the request of the *Royal Veterinary Commission*; the inauguration in Germany at that

time of the law requiring horseshoers to be examined, having emphasized the need of a text-book on theoretical and practical horseshoeing. So that the foundation of the work was laid by no less an authority than the Director of the Shoeing School of the Royal Veterinary College in Dresden. This German work was translated in 1904 by an authority on horseshoeing in our own country, Prof. John W. Adams, A.B., V.M.D., who for nearly twenty years has lectured on horseshoeing to students at the veterinary school of the University of Pennsylvania, and to classes of horseshoers, under the auspices of the Master Horseshoers' National Protective Association of America.

Prof. Adams, being a thorough veterinary anatomist, can fully appreciate the effect of faulty shoeing (either in the preparation of the foot or of the shoe) upon the entire limb, and is likewise in a position to prescribe a form of shoe, or a form of shoeing, to overcome, in whole or in part, the effects of faulty poise or conformation. And he has followed the constant changes in street conditions, necessitating the adoption of newer methods of shoeing, so that in this new, eleventh edition, which has been revised and partly rewritten by him, to which he has added 61 new illustrations and had many redrawn, horseshoeing is brought right up to date, not only in the light of greater scientific knowledge of all subjects involved, but in the modern methods of shoeing; application of rubber pads, the Chadwick springs for expanding the hoof, and other modern appliances.

Every phase of the subject has received his careful attention, so as to bring the work down to meet requirements of the present day in America. Faulty gait, interfering, forging, cross-firing are carefully considered, as well as preparing the hoof for the shoes, making the shoes, fitting them, etc. Also choosing the shoes for saddlers and hunters, runners, trotters and pacers, heavy drafters, etc. He also has a chapter on Hoof Nurture. In short, *Adams' Revised and Rewritten Translation of Lungwitz' Text-Book of Horseshoeing* completely covers the entire subject of shoeing and caring for the horse's feet from a utility standpoint, under normal and abnormal conditions; it is at once scientific and practical, and should be in the library of every practitioner of veterinary medicine.

The publishers have executed their part of the work in a most commendable manner, the paper being of excellent quality, the illustrations stand out sharp and clear, and the type clean and distinct. Bound in dark blue cloth with white lettering, the book makes an attractive little volume.

ARMY VETERINARY DEPARTMENT.

REPORT OF SURGEON-GENERAL, U. S. ARMY, 1913.

FORT MEADE, SOUTH DAKOTA, January 4, 1913.

AMERICAN VETERINARY REVIEW, *New York City*:

DEAR SIRs—I am enclosing a copy of the report taken from the 1913 *Report of the Surgeon-General, U. S. Army*, concerning a proposed veterinary corps. To know the expressed opinion of the late surgeon-general may be of interest to the readers.

“One or more bills have been introduced in congress during the last year to increase the efficiency of the *veterinary service* in the *army*. This office has recommended that this service be organized as a corps and attached to the Medical Department in a manner similar to the Nurse Corps and Hospital Corps. This is not proposed for the aggrandizement of the Medical Department, but because it is believed to be the only way in which that service can be raised to a fitting plane of dignity and efficiency, such as it has held in European countries and in the armies of the great military nations.

“Veterinary medicine is a learned profession with a voluminous periodical and permanent literature of its own. The therapeutics and pharmacy of veterinary medicine are largely the same as for the medical service, and in Europe, where veterinary medicine has the dignity and standing of a learned profession, it has made valuable contributions to our knowledge of the causation of diseases. It is believed that it can be placed on a high standard of efficiency without long-continued application of the same agencies which have raised the Medical Corps of the army to its present high standard. This would not only conduce to the elevation and efficiency of the veterinary service, but would also be in the interest of economy, as all its supplies could be most advantageously purchased, cared for and issued through the machinery of the Medical Department.”

Yours respectfully,

ROBT. J. FOSTER,
Veterinarian, 12th U. S. Cavalry.

RECENT INVESTIGATIONS OF CONTAGIOUS PNEUMONIA OF HORSES, AND THE SALVARSAN TREATMENT OF THIS DISEASE.

By OLOF SCHWARTZKOPF, Veterinarian, Third Cavalry, Instructor, Mounted Service School, U. S. Army.

No other disease has been nearly so damaging to the mounted service of our army since the Spanish-American war, than contagious pneumonia of horses, the most severe of the group of diseases ordinarily called "shipping fever." Year after year is this disease newly introduced into our military posts by remounts purchased in the horse exchanges of our centrally located large cities, where it seems to exist in an enzootic form. Aside from the mortality rate, which ranges in different outbreaks from about 2 to 20 per cent. or more, the other loss sustained by the government is the relatively large number of horses which, although recovered from the disease proper, remain more or less unserviceable for cavalry or artillery service from various chronic infirmities resulting therefrom. These show soon after the remounts are turned into the ranks for schooling and drilling, or they are sure to be recognized during and after the first extensive practice march.

We have no statistics in our army to count the damage wrought by this disease, either in numbers of horses affected or in the money value lost by death and unsoundness. On this point we remain in blissful ignorance, but we can give some enlightenment from the annual reports of the veterinary corps of European armies, which latter likewise, up to a few years ago, suffered heavy losses. For instance, the veterinary report of the German army for the year 1911 gives the following instructive summary: Between the years 1901-1910, 31,190 horses were attacked by this disease, of which 1,304 died. The disease was most disastrous in 1906, in which year 7,581 horses (8½ per cent. of the total mounted strength) were under treatment for this disease, and of which number 283 horses died. In 1910, 2,955 horses were sick with the disease, and of this number 787 horses remained afflicted with the following after-diseases: Weak heart, 152; roaring, 148; broken wind, 106; tendonitis, 72; internal eye diseases, 70; chronic indigestion, 68; joint diseases, 56; partial paralysis, 55; laminitis, 36; purpura hæmorrhagica, 24.

A reflection on these statistical data conveys to us a world of information, because it discloses, in figures, the real damage

inflicted by this disease which, so far, we could only surmise from the experiences gained in our own army.

The above cited statistical report led abroad to immediate energetic measures for the suppression of the disease by embodying it in the Contagious Disease Acts. An entirely new line of research of the etiology of the disease was also ordered forthwith. When this had hardly progressed far enough to bring out really new facts, the announcement of the successful treatment of contagious pneumonia of horses with salvarsan fairly startled the veterinarians abroad, because it had been looked upon as the specific curative agent of human syphilis only. To-day there can be no longer any doubt that the salvarsan treatment of this disease has passed the experimental stage. We should, therefore, make ourselves acquainted with its rather intricate method of administration, as also with the new etiological facts so far brought out in recent investigations. It is well to study the latter first in the brief report given below in translation.

REPORT OF THE ROYAL INSTITUTE FOR INFECTIOUS DISEASES,
BERLIN.

"*Further Investigations of Contagious Pneumonia of Horses*," by Professor Dr. Gaffky and Staff Veterinarian Dr. Luehrs.

(Note of the translator: These investigations commenced in 1910, by request of the War Ministry. The institute was provided with entirely new experimental stables, and over one hundred uninfected young horses were purchased, a larger number of which have been destroyed for post-mortem examinations at different periods of the disease. These reports (Report III., September 9, 1912, and Report IV., December 15, 1912) were published in the *Zeitschrift für Veterinarkunde*, the journal of the veterinary officers of the German army. The results of the investigation are given below in translation and in extract only. For further information the journal cited should be consulted, which also contains four pages of colored plates, giving the gross pathological lesions in diseased lungs of horses, and the micro-organism supposed to represent the new causal agent of the disease.)

Gaffky and Luehrs have reached the following conclusions:

1. The transmission of the disease takes place from horse to horse. All attempts to infect laboratory animals (guinea pigs, rats, mice, skin parasites, stinging flies) have failed. Hairs or

skins of destroyed, diseased horses do not transmit the infection. Stables are only infected for hours or a few days. Horse manure does not carry the infection if brought into new stables. Infected clothing of men and watering troughs probably do so for a brief time, but no intermediate carriers have as yet been identified.

2. The stage of incubation of the disease is at least 16 days, but as a rule it ranges between 20-40 days, occasionally a few days longer.

3. The disease is neither transmissible by inoculation with blood, nor by subcutaneous injection of triturated parts of lungs from diseased horses into healthy horses. The infection is successful by the transmission of the bronchial secretion of diseased horses upon the uninjured nasal cavities or mouth of healthy horses. Occasionally this mode of infection fails, perhaps on account of unsusceptibility of certain horses.

4. The original lesions in the lungs of infected horses are found in the finest ramification of the bronchi and in the alveoli of the lungs, in which also accumulates a secretion of a glassy, transparent, later yellowish, gelatinous material. Cell proliferation into the neighboring tissue soon develops. If these lesions are near the pulmonal pleura, serous exudation into the sub-pleura takes place.

5. In the first stages of the disease, the newly inflamed herds in the lungs are free from any of those bacteria, which heretofore have been designated as the cause of the disease. Apparently they have no connection with the etiology of the disease, but constitute a secondary invasion into the original lesions of the lungs. The early bronchial secretion, still free from bacteria, is nevertheless infectious to healthy horses.

6. Not before the fourth or fifth day after the inception of the disease appear bacteria in the original lesions of the lungs, principally in the form of chained cocci. These produce larger areas of inflammation, hemorrhage infiltration and circumscribed necrosis.

7. The early bronchial secretion contains ciliated epithelial cells in great numbers. Within these cells are often found peculiar, dark particles, which are not looked upon as parasites, but rather as degenerative processes of these cells.

8. In the early secretion of the air passages are also found other epithelial cells, more or less round, with one nucleus, which appear to come from the alveoli or broncheoli. These cells contain peculiar vacuoli, in which are located corpuseles, generally of a round contour, but sometimes staff-like, and mostly six in

number. For more than two years these vacuoli and their contents resisted attempts at staining. Lately, Luehrs succeeded in staining them by Giemsa's method, in which the vacuoli appear in a bright, light-blue color containing reddish corpuscles. That these represent parasites is most probable. They are regularly present in cases of contagious pneumonia, but so far they could neither be found in healthy horses, nor in those afflicted with strangles, or in catarrhal influenza, or in septicæmia, in spite of numerous control examinations.

9. Dr. Zалlos, the zoologist of this institute, has also found cells with one nucleus, in which are embedded vacuoli, containing isolated corpuscles. According to their behavior in staining, he considers them of parasitic nature. With these opinions agrees also Professor Hartman, the chief of the protozoan laboratory.

10. In the course of our experiments it has been found that triturated parts of lung-tissue from horses in the first stage of the disease, if introduced subcutaneously, confer immunity towards infection. If this unexpected result should prove to be constant by further experiments, this proceeding would confer a true antitoxic immunity, because a propagation of the parasites in the subcutaneous tissue seems quite excluded.

THE SALVARSAN TREATMENT—(*Therapeia sterilisans magna*, Ehrlich). Salvarsan took a sudden start to prominence in the treatment of human syphilis, following a previous succession of new discoveries in the etiology of this disease. It was in 1904 when Metschnikoff and Raux proved the transmissibility of syphilis to animals; in 1905 Schaudin and Hoffman discovered a parasite as the causal agent of syphilis, *Treponema pallidum*; in 1906 Wasserman evolved the serodiagnostic test (complement fixation) for the disease; and in 1907 Uhlenmuth announced the successful treatment of certain protozoan infections with atoxyl (dourine of horses, chicken spirillosis, syphilis, sleeping sickness). However, this preparation possesses a high toxicity, and can only be used with extreme caution. In the meantime Ehrlich had worked on a similar line of research, testing a series of 605 modifications, until he found a compound in 606 (salvarsan), which possessed parasitropic properties without at the same time being organotropic.

Salvarsan was first successfully tested on rabbits infected with syphilis. Hoppe tried it on dogs and shortly afterwards on human syphilitic paralytics. Schroeder used it in recent cases of syphilis and established its reputation as a specific, sterilizing agent of the human body infected with *Treponema pallidum*.

The credit of having first used salvarsan in veterinary practice is due to Staff Veterinarian Rips, of the German army. He announced in February, 1911 (*No. 7, Berlin Thierärztliche Wochenschrift*), that, suspecting the real cause of contagious pneumonia of horses to be a parasite similar to syphilis, he had treated with salvarsan several army horses, with results most astonishing to himself. For some time the skeptics had the word, but the correctness of Rips's discovery was soon proven by Corps-Veterinarian Froester, Chief of the Army Veterinary Laboratory at Berlin, and by his assistant staff-veterinarian, Dr. Reinecke, who also constructed an ingenious apparatus for the administration of salvarsan. Since three years the salvarsan treatment of contagious pneumonia has been obligatory in the German army, and has proven a boon to the horse, such only as was the Schmidt treatment of milk fever to the cow in the year 1898.

Salvarsan is chemically the dichlorhydrate of the dioxymidoarsenbenzol, an arsenical salt derived from atoxyl, and contains 34 per cent. of arsenic. It is normally a yellow powder, slowly soluble in water. If exposed to air, it oxidizes, becomes brown and toxic, and it is, therefore, put up in sealed glass tubes filled with nitrogen. The price of salvarsan in the United States is \$4 per dose.

Method of Application—The method employed in the treatment of contagious pneumonia of horses consists in the intravenous infusion of a blood-warm, diluted, alkaline and sterile normal salt solution of salvarsan. The therapeutic dose of salvarsan is 0.01 gm. per kilogram (lbs. 2.2) of the body weight of the horse, the largest amount to be used being 3.0 gm. The solution is prepared by adding to 500. gm. of a sterile salt solution of distilled water (0.06 per cent.), at a temperature of 113°-120° F., about 3.0 gm. of salvarsan. This mixture is shaken until solution has taken place, when 30-40 drops of a 15 per cent. solution of sodium hydroxid is added, until the solution reacts alkaline to litmus. The preparation takes time and demands laboratory practice.

The infusion is made by a special apparatus, devised at the Army Veterinary Laboratory, Berlin, and sold by H. Hauptner, Luisenstr., Berlin, and by Fimer & Amend, New York. The hairs of the middle of the left side of the neck are clipped, the skin sterilized with tincture of iodine, and the infusion made into the jugular vein while the head of the horse is slightly turned to the right. The seat of infusion should be closed with collodium.

The salvarsan infusion is generally applied only once, before

the height of the disease has been reached. If complications have set in after five or six days of duration of the disease, a second infusion of 2.0 gm. may become necessary, and three days later still another infusion of 3.0 gm., but these only in exceptional cases.

Neosalvarsan is the latest preparation of Ehrlich (year 1914), prepared by condensation of the formaldehydsulfoxylacid of sodium with salvarsan. It is a dark yellow powder, readily soluble in water, and it reacts neutral so that no addition of sodium hydroxide is needed in preparing the infusion. Neosalvarsan, 1.5 gm., is equal in therapeutic strength to 1.0 gm. of the older salvarsan. The salt solution in the prepared infusion should not be stronger than 0.3 per cent. Rips dissolves 4.0 gm. neosalvarsan in 110 gm. of a 0.3 per cent. salt solution under a heat of 25° Celsius. The price of 4.5 gm. neosalvarsan is equal to 3.0 gm. of the older salvarsan.

The Therapeutic Effects of Salvarsan—The immediate and prominent effect of the salvarsan infusion, if made early in the disease, is the fall of the notoriously high internal temperature within twenty-four hours. During the first four to eight hours after the infusion the temperature still rises somewhat higher (0.5-2.0° Celsius), and then a steady decline is observed. Irregular or retarded fall of temperature is seen if pneumonia has already set in, but in such cases the duration of the disease is greatly shortened and complications are avoided. If salvarsan is administered early enough, the development of pneumonia is prevented.

With the fall of temperature a reduction in the pulse rate of 20-30 per minute is also observed, so that the heart is quickly unburdened.

Two or three days after the infusion the general effect of salvarsan shows itself in the returning appetite and mental alertness of the horse. There is a short stage of convalescence, all symptoms of sickness disappear, no signs of debility or loss of condition are noticeable, and the various after-diseases of contagious pneumonia have been prevented. It is now known in the German army that the prompt treatment of a first case prevents an outbreak among the horses of a troop.

Immunity towards reinfection is conferred by salvarsan under a certain mode of application. It had been quite long known that horses which had slowly recovered from this disease are immune for the rest of their lives, and they had been marked "immunes" in the army. Since the introduction of the salvarsan treatment it has been found that a very early administration of salvarsan,

although it stops the disease abruptly, confers immunity for a short time only. Rips advised, therefore, to postpone the infusion until the third day after the fever has set in, in order to give the living organism of the horse time enough to produce antibodies. The natural immunity produced thereby, together with the effect of the salvarsan treatment, confer a lasting immunity from the disease. However, care must be taken not to defer the infusion until after the third day of the inception of the disease, as complications are liable to have set in, which would lengthen the course of the disease. If immunity from the disease is an important factor, as it is in large garrisons, this delayed treatment is preferable to the immediate treatment, which stops the disease in its incipency.

The prophylactic action of salvarsan has proven to be weak, and as no perceptible immunity is conferred by a prophylactic treatment, it is more practical to let the disease develop until the third day. The peculiar effect of salvarsan in contagious pneumonia is now explained by Ehrlich as due to the direct destruction of the parasites. Salvarsan belongs to a series of organic arsenics, so-called sessile arsenics, poisons which are not hurried through the body, but which remain bound to the cells for days or weeks.

Ill effects of salvarsan infusion have been reported in several instances. They consisted mostly in restlessness of the patient, colic pains, accelerated breathing, trembling, grinding with the teeth, perspiration and fever chills. These symptoms are, however, without consequence and last only about one-half hour. The appearance of these untoward symptoms is now explained as not due to salvarsan, but to faulty distilled water or to an unskillfully prepared infusion. The commercial distilled water, as well as that prepared in small army veterinary laboratories, often contains sodium chlorate and many dead bacteria, which latter act as foreign albuminoid bodies, producing a temporary poisonous effect. Unskillfully performed infusions are liable to produce abscesses on the seat of operation. There have been also reported a few cases of accidental perforation of the opposite wall of the jugular vein. Several deaths have occurred in cases in which the salvarsan infusion was still made after necrotic pneumonia had set in, as proven by post-mortem examinations. A regular result of salvarsan treatment is palyuria, which sets in twelve to twenty-four hours after the infusion. This has always been observed in the critical stage of contagious pneumonia long before the discovery of the salvarsan treatment.

Conclusions—From the above reports it can be seen that, while the true parasite of contagious pneumonia of horses has not yet been correctly identified or named, the salvarsan treatment has proven an absolute success. Therapeutics has in this disease, as in several other parasitic diseases, outdistanced pathology.

As the salvarsan treatment is neither effective in the treatment of strangles (distemper of horses), nor in catarrhal influenza (pink eye, epizootic, etc.), but only in contagious pneumonia (stable pneumonia, contagious pleuro-pneumonia of horses), we must hereafter differentiate more carefully between the two former diseases and the latter. We all know that a herd of remounts generally carries a mixed infection of these diseases, and that in the beginning the symptoms exhibited of this group of diseases are similar, because all three constitute affections of the respiratory tract. Careful clinical observation (fever charts), as well as the skillful use of physical diagnosis (auscultation and percussion), are the only safe means of correct differentiation, which is so essential for discriminate treatment and the safety of uninfected horses. Undoubtedly many horses suffering from contagious pneumonia have heretofore been treated merely for "influenza," a much abused generic term that has served as an excuse for correct diagnosis. Under the backward conditions of our army veterinary service, we have done the best we could in the treatment of these diseases, and have been trying to be up to date by the use of bacterines, vaccines, sera, both prophylactic and curative, in tablet form or in fluid form in sealed tubes, etc. While most of us will gladly admit that, along with open-air treatment, faithful nursing and proper diet, these modern preparations favorably influence the organism of the horse towards recovery from the ordinary cases of strangles and catarrhal influenza, they have certainly failed in contagious pneumonia to alter or check the progress of this disease, and the living body was left to fight out the battle towards victory or defeat with this new medication, just as it had to do so in the older treatment by drugs.

With these facts and considerations before us, we cannot but welcome the advent of salvarsan therapeutics as a boon to the horse. This treatment serves the double purpose to save the life of horses and to preserve those others, imperfectly recovered from this destructive disease, as sound and fit for the hard and very necessary work which they so willingly perform in the service of the government.

SOCIETY MEETINGS.

SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION.

Meeting was called to order in the rooms of the Board of Trade, Reading, Pa., December 17, 1913, at 11 a. m., by Dr. M. D. De Turk, president. The following members were present: Drs. G. Noack, U. S. G. Bieber, D. R. Kohler, W. G. Huyett, G. R. Fetherolf, F. H. McCarthy, M. D. De Turk, W. J. Dunkelberger, R. L. Berger, D. H. De Turk, and F. U. Fernsler. Visitors present are: Dr. C. J. Marshall, Philadelphia, state veterinarian and secretary State Live Stock Sanitary Board; Dr. D. B. Fitzpatrick, Philadelphia; Dr. E. A. Kerns, Kansas; Dr. C. R. Potteiger, Reading; Dr. G. R. H. Kauffman, Birdsboro, and Roy Stauffer, Boyertown.

The minutes of the previous meeting were read and approved. The president gave a brief address, in which he expressed himself as being in sympathy with the members being active and put forth all efforts in increasing the membership.

Under new members proposed, three propositions were presented and handed over to the Board of Trustees for their consideration.

The Board of Trustees announced they had acted favorably on the applications for membership received as follows:

Dr. C. R. Potteiger, Reading; Dr. G. R. H. Kauffman, Birdsboro, and Dr. Irwin S. Reifsnyder, Collegeville.

Upon motion, the rules were suspended, the report of the committee accepted and the secretary instructed to cast a vote collectively electing all applicants to membership. Relative to this motion President De Turk declared the three applicants elected to membership.

A motion was made and seconded to adjourn for lunch. The afternoon session was called to order at 1.30 p. m. The secretary read a number of communications, and they were adopted and filed.

Reports of delegates to other associations.

Dr. Kohler and Noack reported briefly, while Drs. Marshall

and Fitzpatrick also reported upon the progressiveness of the Keystone Veterinary Medical Association.

The treasurer's report was now received and accepted.

Dr. C. J. Marshall, the newly elected president of the American Veterinary Medical Association, being called upon by the chair, gave an interesting address.

He referred to recent legislation, which modified some of the meat and milk inspection laws, mentioning also that the Act of March 25, 1903, known as the Butchers' Indemnity Act, has been repealed. Two bills relating principally to milk and meat inspection were defeated, but one which proves to be of general interest was passed.

He says, the handling of interstate cattle was not satisfactory to the board under the old law; that many drovers, in some manner, managed to transfer shipments of cattle without having them tested. Upon modifying this law, all foreign cattle intended for shipment into Pennsylvania should be inspected and tested before being brought into the state, otherwise they may be brought in only under supervision of a member, officer or agent of the board, after due notice of such shipment, has been given. When cattle have been brought in under the latter clause, they are inspected and tested by duly appointed agents of the board at the expense of the state; thus the permit system, formerly in vogue, allowing cattle to be brought in under quarantine to be tested at destination, has been discontinued.

In reply to questions from members, Dr. Marshall said, the testing of interstate cattle and the compensation received for such work by the local veterinarian was in many instances a matter for consideration: the dealer usually secured the cheapest veterinarian, regardless of competency, and that three-fourths of the practitioners would not do the work at such compensation, hence at present, if cattle are brought into the state, they are looked after by authorized men of the board, which step also proves more economical to the state.

Again, if native cattle are tested prior to the day of sale, the dealer will be unable to secure indemnity for such cattle, should some react, but the owner from whom the dealer bought can secure some, provided he signs the contract of the board and lives up to its obligations.

Dr. Fitzpatrick enlivened the association with his remarks, relating his varied experiences with the use of mallein and tuberculin.

All the members present took a keen interest in these discus-

sions. A member declared that all left-over mallein or tuberculin, after a test had been made, should either be returned immediately to the office of the board or destroyed.

Dr. Marshall replied that the strength of retest tuberculin was about five times the strength of the regular tuberculin, and that advanced cases of tuberculosis may be given three or four times the ordinary dose in testing cattle.

An invitation was extended to this association to participate in the European tour, under the auspices of the American Veterinary Medical Association and directed by Dr. Adolph Eichhorn next summer, as a preliminary to the tenth international veterinary congress, which will be held in London in August. Tourists leaving Saturday, June 13, and returning on August 23, 1914.

ESSAYS AND PAPERS.

Dr. A. R. Potteiger being absent, the next essayist, Dr. R. L. Berger, was called upon to read his paper on "Tetanus." This was a very practical paper, he having related his experience with the serum treatment, having had good results. Much general discussion took place. Dr. Noack says, there are more failures in using the serum than in not using it, and, besides, the expenses of the drug is a matter of consideration with the client. He prefers the phenol treatment, and thinks 50 per cent. of tetanus cases can be cured in this manner if administered at the proper time.

Dr. Marshall claims you can get more recoveries by leaving the patient free from all medicine, but strongly advocates the use of the anti-toxin as a preventive in every instance of operation or other wounds where the tetanus germ may gain exit.

Dr. Fitzpatrick proposed a new remedy for the treatment of tetanus in *iodokvin*, a preparation of iodine, and suggested the members give it a fair trial in their cases. A member announced that all tetanic wounds should be thoroughly cleansed and then rendered aseptic by the use of tr. iodine.

Dr. Fetherolf now presented his paper, namely, "The Agglutination and Complement Fixation Test for the Diagnosis of Glanders." The explanation was made with carefully prepared charts, illustrating every process of laboratory work in conducting the test, which proved very instructive to the audience. Much discussion followed. This test was declared the best diagnosis for glanders, and does not fail in one out of a thousand cases.

A motion was made and seconded that a vote of thanks be tendered Drs. Marshall, Fitzpatrick and Kerns for their presence and assistance in making this session a good one. Motion made and seconded to adjourn.

Next meeting June 17, 1914, at Reading, Pa.

W. G. HUYETT, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

November Meeting.

The regular monthly meeting of the V. M. A. of New York City was called to order in the lecture room of the New York American Veterinary College, Wednesday evening, November 5, 1913, at 8.30 o'clock, Dr. McKinney presiding.

The minutes of the October meeting were read and approved.

Dr. John A. McLaughlin read an interesting paper entitled "The Tissue Medicine." This paper advanced some new ideas in physiology which were rather startling to most of the members and visitors present.

Dr. Duncan (M.D.), who was present, said that this article had started him thinking, and he hoped to profit by having heard it.

Dr. J. F. DeVine, of Goshen, said that Dr. McLaughlin's paper has shown a great deal of thought and study, and he was gratified to have heard it read.

It was suggested that a committee be appointed to study and discuss this paper at a future meeting. Acting on this suggestion, Dr. McKinney appointed Drs. Gill, Coates and Blair.

Dr. Gill suggested that physiologists of prominence, such as Drs. Carrel and Lusk, should be consulted.

After some further discussion it was decided to defer further talk on this subject until the committee appointed could report at a future meeting.

Dr. Brotheridge asked for information regarding cocaine and the refusal of druggists to fill prescriptions containing this drug, issued by veterinarians.

Dr. Griessman read an opinion of the attorney general relative to this drug which stated that physicians only are allowed to write prescriptions for the same. Veterinarians and dentists are allowed to handle cocaine in the original package only.

Some discussion as to the advisability of having a specific and definite agreement with counsel for the prosecuting committee was then brought up. Dr. Smith stated that the committee had an agreement with its present counsel to render services for fifty dollars for three months.

No further business appearing, the meeting adjourned.

R. S. MACKELLAR, Secretary.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

(December Meeting.)

The regular monthly meeting of this association was called to order by President McKinney in the lecture room of the New York-American Veterinary College, December 31, at 8.45 p. m.

The minutes of the November meeting were read and approved.

The annual report of the Prosecuting Committee was read and, on motion, was ordered received and spread in full on the minutes. It follows:

December 3d, 1913.

Mr. President and Fellow Members.—Herewith I beg, on behalf of the Prosecuting Committee to present a brief report of the work done during the current year.

Upon investigation of the conditions which affect the practice of veterinary medicine in New York State your Committee found the following classes of men competing with the regularly licensed veterinarians.

1. Those who attended the prescribed course of study and received a diploma, but never passed the necessary State Board examination for a license.

2. Those who took a more or less complete course in a veterinary college, but did not receive a diploma nor a license.

3. Foreign graduates who never took the State Board examination.

4. Veterinarians from neighboring States who never passed the State Board examination and are therefore unlicensed here.

5. Undergraduates who practice under the protection of a licensed veterinarian.

6. A large class of men who have had little or no training at all, like dog fanciers, horse shoers, grooms and the advertising patent medicine faker. The investigation by your Committee disclosed the fact that owing to the large number of these illegal and often ignorant practitioners, much harm is being done to the animals treated, and, furthermore, that the public is endangered by the unchecked spread of preventable contagious disease.

Your Committee also is of the opinion that the educated, trained and skillful licensed veterinarian should be protected in his calling from the unfair competition of these quacks, who necessarily bring the whole profession into disrepute.

In view of this, your Committee put forth their best efforts to combat the evil as far as their limited finances would permit.

Something like 15 meetings were held and about 39 appearances in Court made. In one case your Committee withdrew the complaint because after arrest the defendant made a plea for time in order to pass the examination.

Several convictions were obtained and fines of \$25 to \$50 imposed. Others qualified and complaints were withdrawn; and in still others, sentences were postponed for one reason or another.

It will be remembered that conviction is difficult because these offenders usually obtained learned counsel to defend them, and they are often the object of mistaken sympathy and occasionally they bring to bear in their favor the weight of political influence.

Furthermore your Committee has at the present time under investigation the cases of 53 supposed illegal practitioners.

The average cost of prosecuting such a case is \$29.50.

Upon instalment of your Committee the sum of \$243.95 was recived from the Committee of 1912. The expenditures were as follows:

The sum of \$206 was paid out for counsel fees, searchers in the County clerk's office, photographs for court exhibits, printing, postage and sundries. The itemized account of these expenditures are fled with the treasurer. Balance on hand, \$37.95.

From the above it will be apparent that the work thus begun will be greatly impeded unless the necessary funds can be put at the disposal of your committee to go on. The task the Committee have set themselves is to rid the profession of veterinary medicine in the City and State of New York of the horde of illegal practitioners, which are like a canker gnawing at its vitals.

In order to obtain funds for a similar purpose other organizations have hit upon various plans.

Some have raised money by a per capita assessment of its members. This your committee does not advocate.

Some, like the County Medical Society, have had a law passed which gives them all cash fines obtained from convicted offenders by process of law. Of this more at some future time.

The thanks of the Prosecuting Committee are due to our esteemed President, Dr. W. J. McKinney, also to the officers and members of the society for their loyal support.

Respectfully submitted,

DR. CHAS. JAIMESON, *Chairman*,
DR. MAFFITT SMITH,
DR. LOUIS GRIESSMAN.

Next in order the discussion of Dr. J. A. McLaughlin's paper, read at the last meeting, was taken up.

Dr. R. W. Ellis said that Dr. Thos. B. Kenny (M.D.) had kindly consented to review this paper and had prepared a criticism on the same.

Dr. Kenny was then introduced and read his analysis of Dr. McLaughlin's paper, "The Tissue Medicine."

Both Dr. McLaughlin's paper and the analysis of the same by Dr. Kenny have been published in the AMERICAN VETERINARY REVIEW, so it is needless to give detail in these minutes.

At the conclusion of Dr. Kenny's analysis, Dr. McLaughlin

expressed himself as highly gratified and well repaid for having written his paper.

Dr. A. Slawson, of New York City, then read an interesting paper entitled, "Lympho-Sarcoma in the Dog," and exhibited specimen of the same in which the members and visitors were much interested.

Drs. Kenny and Slawson were tendered a unanimous vote of thanks for their contributions to the program of the evening.

The Secretary-Treasurer then read his annual report. The auditing committee having examined the financial statement, this report, on motion, was ordered received. (A balance of \$60.65 was reported in the treasury). Nine regular meetings had been held during the year. Interesting papers have been read and discussed, and pathological specimens exhibited. The total membership is sixty-one. Six new members were admitted during the year.

This being the annual meeting the next order of business was the election of officers for the ensuing year.

The election resulted as follows: Dr. W. J. McKinney, re-elected President; Dr. P. Burns, Vice-President; Dr. R. S. MacKellar, Secretary and Treasurer

Dr. T. E. Smith and Dr. Chas. V. Noback, having made regular application for membership and having been duly approved by the Board of Censors, were unanimously elected to membership in this Association.

Dr. Clayton moved that a committee be appointed to revise the By-Laws, and that copies of the same be printed, after approval of the revision of the same—seconded and carried.

The President appointed on this committee Drs. Ellis, Blair and MacKellar.

No further business appearing the meeting adjourned.

R. S. MACKELLAR, *Secretary*.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION.

The twentieth annual meeting of the above association was called to order by the president, Dr. R. R. Clark, at Richmond, January 9, 1914.

Twenty-five answered the roll-call. After the usual routine business the following program was presented:

An exhaustive paper by Dr. D. E. Buckingham, of Washington, D. C., on "*Therapeutics of the Eye.*"

A paper by Dr. S. C. Neff, of Staunton, on "*Obstruction of the Diaphragmatic Flexure of the Large Colon.*"

A paper by President R. R. Clark, of Hampton, on "*Hemorrhagic Septicaemia in Cattle.*"

All of these papers were replete with valuable information. The profession in the "Old Dominion" is on the move. The members of the association are wide awake and are making their influence felt all over the State.

The officers for the next year were elected as follows: President, Dr. R. R. Clark, Hampton; First Vice-President, Dr. B. B. Glover, Lexington; Second Vice-President, Dr. H. H. Adair, Bristol; Secretary-Treasurer, Dr. Geo. C. Faville, North Emporia.

The annual banquet was held at Murphy's Hotel, and the members showed the good effects of an active out of doors life by the manner in which they attacked the good things to eat. Covers were laid for thirty. The association adjourned, to meet in Staunton, Va., on the 2d Thursday in July.

The Board of Veterinary Examiners meets at the same time and place.

GEO. C. FAVILLE,
Secretary-Treasurer.

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

The above association held its thirty-first annual meeting at the College of Veterinary Medicine, Ohio State University, on January 14th and 15th. The meeting was the largest in the history of the Association, 227 being in attendance. The principal items of the programme were as follows: The Inaugural Address by President Cooly; an address by Dean White of the Ohio State Veterinary College, on "The State and Veterinary Education"; a lecture by Prof. W. L. Williams, of Cornell University, on "Retention of Placenta"; a lecture by Dr. R. P. Lyman, of the Michigan Agriculture College, on "Health Disturbances Consequent Upon the Invasion of the Digestive Tract by Animal Parasites."

The dinner was held at the Ohio Union on the evening of the first day of the meeting and almost two hundred enjoyed this social feature.

The officers elected for the ensuing year are. Professor S. Sisson, President; Dr. F. F. Sheets, Vice-President; Dr. R. Hilty, Toledo, Ohio, Secretary; Dr. D. S. White, Treasurer.

REUBEN HILTY, Sec'y.

ADDRESS BY DR. A. JOLY, LIVE STOCK SANITARY COMMISSIONER.

AT A BANQUET OF THE MAINE VETERINARY MEDICAL ASSOCIATION, AT PORTLAND, JAN. 14, 1914.

Mr. President, Ladies and Gentlemen—I wish to congratulate the banquet committee upon the success of this gathering, and the happy thought of having the ladies present.

I do not believe that we could begin the year in a better manner than to have our wives and sweethearts participate and assist us in forming resolutions for the year 1914.

I am sure that the ladies feel greatly interested in our enterprises and in all the problems which confront the veterinary profession.

I suppose that you have all seen or heard of the play called "Brewster's Millions"—the task he had to get rid of a fortune in a certain length of time, in order to inherit a second fortune.

I was in about the same predicament after the legislature of 1913 had granted my office an appropriation of \$50,000 a year; but with your able assistance, Brother Veterinarians, I have succeeded in spending it all. I am left with a balance of \$132, just enough to pay for the printing of my annual report.

I must have been right when a year ago I told the committee on agriculture that \$50,000 was needed, and bear in mind that all my bills had to be scrutinized by the commissioner of agriculture and approved by the state auditor.

Nevertheless I have reverted to the state treasurer the sum of \$8,637, net proceeds received from hides and carcasses. Such amount could have been added to my appropriation if needed.

I feel that our sanitary laws have been carried out as they read; our mission has been well filled, I can assure you it will stand criticism, and our aim has been, at all times, to give everybody a square deal.

We have condemned 1,026 animals which were a menace to

public health and to the live stock industry. We have cleaned out 643 herds infected with tuberculosis. Right here in Portland the milk supply came from the most dangerous sources. From the middle of November to the first of January, in six weeks' time, 52 herds were found infected and 192 head of cattle were condemned.

But such conditions do not exist all over the state. We have some other data which is more encouraging. For instance, out of 5,572 milch cows shipped from Maine to Brighton Market and tested there, only 136 were condemned; a percentage of about 2½ per cent. I believe that these 5,572 head of cattle came from as many different and scattered herds of the state, and the percentage is very gratifying.

Our work shall go right along, and I do not worry about spending another \$50,000 during this year, for we must have a clean milk supply; we owe it to the public.

It is not a question of how many persons out of a thousand take the disease or die from bovine infection. The fact has been established that it is communicable to man, and it is our duty, both as an association and as individuals, to use all our efforts to protect our citizens from this source of danger.

By the honest and intelligent work of its members, the standard of the veterinary profession in our state has been raised in the esteem of the public. It is up to us to bring it abreast with the practitioners of human medicine.

Neither horse jockeys nor cow jockeys should have any influence in our midst. There is only one way of testing cattle. There should be not one method when an animal is sold and another when it is purchased.

Let us be honest in our daily purpose, and without being mistaken, I can prophesy a great future and remarkable possibilities for the veterinary profession of Maine.

Inside of two years we shall have a meat inspection law all through the state. Maine is awakened and will raise beef.

The 35,000 calves which are being shipped every year to Watertown and Brighton Markets will be kept on our Maine farms, and inside of five years Maine will have its own stock-yards. Municipalities shall have their milk supply from tested herds, yearly inspected by a local official.

With our other sanitary laws in relation to the importation and exportation of live stock, there will be ample occasion for the honest and able veterinarian to prove to his community his indispensable usefulness.

RHODE ISLAND VETERINARY MEDICAL ASSOCIATION.

The annual meeting of the Rhode Island Veterinary Medical Association was held at Elks' Hall afternoon of January 15, 1914, and much interest was taken in the proceedings, as many interesting topics pertaining to the welfare of the profession were discussed, especially the present milk situation; legislative bills pertaining to improvement of same, better sanitary laws, and enforcement for meat, milk and provisions. Statistics were read from several states and cities, showing that Rhode Island was practically alone in lax laws regarding hygienic conditions, as only two veterinarians were officially employed to assist in improving sanitation, while in nearly all states and cities veterinarians are appointed on state and municipal health boards. Evidently the "Heads" of said boards are not aware of the fact that the educated veterinarian of to-day is better qualified to cope with the situation than officeholders in "Little Rhody." Several communications were read from other states, pertaining to association progress along the up-to-date methods being used in meat and milk inspection. The election of officers resulted in Dr. U. S. Richards, of Woonsocket, as president; Dr. G. L. Salisbury, Lafayette, first vice-president; Dr. E. J. Sullivan, Georgiaville, second vice-president; Dr. T. E. Robinson, Westerly, treasurer, and Dr. L. T. Dunn, Providence, secretary.

The new president made the following appointments for the ensuing year: Executive Committee, Diseases, etc.: Drs. Pollard, Robinson, Cole; Legislative Committee: Frey, Jones, Pollard, Salisbury; Finance Committee: Robinson, Sullivan, Dunn.

After adjournment, refreshments and lunch, with reports of interesting cases, concluded the meeting.

L. T. DUNN, Sec'y.

O. S. U. PROFESSOR DIES OF GLANDERS.—*Prof. Jansen Contracted Fatal Horse Disease in Laboratory Research Work.*—Columbus, January 5.—Prof. Andrew M. Jansen, of Ohio State University, infected during laboratory research work, is dead to-day of glanders, a disease common to horses. He was ill 25 days. The real cause of illness was not established until three days ago. —(*Dayton Evening World*).

NEWS AND ITEMS.

THE LOBECK CLASSIFICATION BILL FOR B. A. I. EMPLOYEES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after July first, nineteen hundred and fourteen, the Secretary of Agriculture shall classify the salaries of the veterinary inspectors, the meat inspectors, the inspectors' assistants, the stock examiners, the skilled laborers and the clerks as herein-after provided.

Sec. 2. That all veterinary inspectors within the classified service and actually employed as such in the Bureau of Animal Industry of the Department of Agriculture now established—first, that the entrance salary of said veterinary inspectors shall be \$1,400 per annum, and those who at the date of July first, nineteen hundred and fourteen, may be receiving a salary of less than \$2,400 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their salaries shall amount to \$2,400 per annum; further increase in salary to be made at the discretion of the Secretary of Agriculture.

MEAT INSPECTORS' MAXIMUM, \$1,600.

Sec. 3. That all meat inspectors within the classified service and actually employed as such in the Bureau of Animal Industry of the Department of Agriculture now established—first, that the entrance salary of said meat inspectors shall be \$1,600 per annum, and those who at the date of July first, nineteen hundred and fourteen, may be receiving a salary of less than \$1,600 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their salaries shall amount to \$1,600 per annum; further increase in salary to be made at the discretion of the Secretary of Agriculture.

Sec. 4. That all inspectors' assistants within the classified service and actually employed as such in the Bureau of Animal Industry of the Department of Agriculture now established—first, that the entrance salary of said inspectors' assistants shall be \$840 per annum, and those who at the date of July first, nineteen hundred and fourteen, may be receiving a salary less than \$1,600 per annum, shall thereafter, from the said date, receive an annual increase of \$100 until their salaries shall amount to \$1,600 per annum; further increase in salary to be made at the discretion of the Secretary of Agriculture.

Sec. 5. That all stock examiners within the classified service and actually employed as such in the Bureau of Animal Industry of the Department of Agriculture now established who, at the date of July first, nineteen hundred and fourteen, may be receiving a salary of less than \$1,600 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their salaries shall amount to \$1,600 per annum; further increase to be made at the discretion of the Secretary of Agriculture.

Sec. 6. That all skilled laborers within the classified service and actually employed as such in the Bureau of Animal Industry in the Department of Agriculture now established who, at the date of July first, nineteen hundred and fourteen, may be receiving a salary less than \$1,200 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their salaries shall amount to \$1,200 per annum; further increase in salary to be made at the discretion of the Secretary of Agriculture.

Sec. 7. That all clerks outside of the executive offices in the city of Washington, District of Columbia, within the classified service and actually employed as such in the Bureau of Animal Industry of the Department of Agriculture now established—first, that the entrance salary of said clerks shall be \$900 per annum, and those who at the date of July first, nineteen hundred and fourteen, may be receiving a salary less than \$1,500 per annum, shall thereafter, from said date, receive an annual increase of \$100 until their

salaries shall amount to \$1,500 per annum; further increase in salary to be made at the discretion of the Secretary of Agriculture.

ADDITIONAL APPROPRIATION.

Sec. 8. That there be, and is hereby, appropriated such additional sums to the \$3,000,000 annual appropriation provided for in the meat-inspection Act approved June thirtieth, nineteen hundred and six, found in the Thirty-fourth Federal Statute, page six hundred and seventy-four, as may be necessary to carry into effect the provisions of this Act, and that such additional appropriation shall be deemed an annual appropriation.

Sec. 9. That all Acts and parts of Acts, except the meat-inspection Act approved June thirtieth, nineteen hundred and six, inconsistent with this Act be, and the same are, hereby repealed.

REGULATIONS GOVERNING THE ADMISSION OF LIVESTOCK TO PENNSYLVANIA.—Horses, mules, asses, sheep, goats, pigs, dogs, cats and poultry must be free from transmissible diseases.

Bovine Animals.—Those for immediate slaughter and apparently healthy calves under six months of age, except southern cattle and those for temporary exhibition purposes, may be brought into Pennsylvania without restriction. Southern cattle for immediate slaughter and all bovine animals for temporary exhibition purposes can be admitted only on a special permit from the State Veterinarian of Pennsylvania. All other bovine animals must be accompanied by a health certificate and a tuberculin test chart. Those not accompanied by the health certificate and tuberculin test chart as required by law can be brought in under the direct supervision of a member, officer or agent of the State Livestock Sanitary Board. For the present, such supervision shall mean that where the purchaser cannot make satisfactory arrangements in another State for the health certificate and tuberculin test, he may bring them in subject to the following regulations:

“The shipper must communicate with the Harrisburg office, giving the number of cattle and stating when, where and how they are to be brought in. If they are to be shipped in, he must give the shipping station, the railroad or railroads over which they are to be shipped and the destination in Pennsylvania. He will then be notified by mail or telegram to drive or ship such animals, subject to regulations at destination. Arrangements have been made at the Union Stock Yards in Pittsburg and Lancaster for the examination and test of such stock by an agent of the State Livestock Sanitary Board. Apparently healthy steers will not be submitted to a tuberculin test, provided they are not to be kept with dairy or breeding cattle.”

Bovine animals brought into the Commonwealth under conditions not set forth above may be quarantined at the expense of the owner at any point in Pennsylvania and submitted to the

physical examination and a tuberculin test by an agent of the Board.

WHO MAY MAKE THE PHYSICAL EXAMINATION AND TUBERCULIN TEST.—State Veterinarians, inspectors of the Bureau of Animal Industry, officially certified veterinarians in the State from which the cattle originate and agents of the Pennsylvania State Livestock Sanitary Board.

EVEN VETERINARIANS:—Ever vigilant in guarding the interests of our profession, Dr. Dalrymple was aroused by a discussion at a meeting of the Louisiana Pharmaceutical Association and sent the following letter to the Editor of *The Times Democrat*, New Orleans:

“In a discussion which took place at the meeting of the Louisiana Pharmaceutical Association, Dr. Asher is reported to have made the following remark: ‘Even nurses and veterinarians are trying to raise the standard of their profession by introducing elevating legislation.’ This is quite true with reference to the veterinary profession in Louisiana, where it has only been known as a profession less than two decades, but it is so known now throughout the entire United States and Canada, and, in the case of some of its members, on the other side of the Globe. However, I am not writing this in any spirit of criticism, as I do not believe any reflection was meant by Dr. Asher’s statement. At the same time, that little adverb, ‘even,’ has an inferential significance tending to produce the impression on the public mind that the veterinarian is a somewhat lower order of being who is only now trying to obtain public recognition. And it is to endeavor to correct this impression that I am sending you this communication.

“In European countries the veterinary profession stands on equal footing with all of the other so-called learned professions, and the course of study is similar in length and requirements to that of other branches of medicine.

“Parenthetically it might be mentioned here that when the writer came to Louisiana some twenty-four years ago, he had passed a college course in veterinary medicine and surgery of about twice as long as that then required by the majority, at least, of the southern medical colleges to graduate practitioners of human medicine.

“Coming over to our own country the United States and Canada have some very fully equipped veterinary schools. The University of Pennsylvania has its splendid veterinary school as it has its medical institution, with a course of study running

through three years of eight or nine months each. Cornell University also has a very fine veterinary institution with a course running similar to the other university courses in point of time. Many of the State universities and colleges throughout the country have their regular veterinary schools occupying the time of a full university or college course of eight or nine months each year. In fact the private schools, of which there are but a few now, are required by the Association of American Veterinary Colleges and examining boards to extend their courses to at least three years of not less than eight months each. And, unless they do so, their graduates are not eligible to membership in the American Veterinary Medical Association, nor to civil service examinations for positions in the United States government service.

"The American Veterinary Medical Association, as an organization, is one of the most ethical in the country, and its constitution and by-laws as strict as any other society that has to deal with the subject of medicine. And, further, some of the most renowned pathologists of the day are members of the veterinary profession, a number of whom have been knighted by their sovereigns for exceptional services rendered in the cause of humanity, and in the interest of agriculture in its broadest sense.

"As stated at the beginning, this is not written in a spirit of criticism, but to checkmate, if it will, the impression that may have been left on the mind of those reading that part of Dr. Asher's discussion referred to, in relation to the veterinary profession. However, although that little word, 'even,' might, with all justice, have been omitted in connection with Dr. Asher's reference to, and praise of, if you will, the veterinary profession for what it was endeavoring to do, it is not at all surprising when one thinks of the appalling lack of correct information that prevails in some quarters with regard to the general standing of the veterinary profession in all civilized countries, notwithstanding it dates back to the days of Hammurabi, 2,100 years before the Christian era; and the more modern school, from about the middle of the eighteenth century, where the eminent French jurist, Bourgelat, established the Lyons (France) school, which was subsequently patronized by royalty, and to which students flocked from almost every civilized country of Europe. From the foregoing, therefore, it may be inferred that the veterinary profession of to-day has a standing that full entitles it to every protection and elevation that a State, or the nation, is able to afford it."

W. H. DALRYMPLE, M.R.C.V.S.,

Baton Rouge, La.

AMERICAN SURGEON'S SLIGHTING STATEMENT IN REGARD TO VETERINARIANS AROUSES RIGHTEOUS INDIGNATION OF EMINENT LONDON VETERINARIAN.—The following clipping from the *London Times* suggests the narrowness of the views of some men in regard to other callings, even though standing at the top in their own. Sir John McFadyean so valiantly defends our profession that we have reproduced it, feeling sure all our readers will enjoy reading it:

VIVISECTION AND VETERINARY SCIENCE—*To the Editor of the Times.*—SIR: According to the report which appeared in *The Times* of Friday last, Professor Harvey Cushing, in the course of an address which he delivered on the previous day to the members of the Congress of Medicine, made the statement that, "Most veterinarians have profited not at all by the advance in general medical knowledge of the past generation," and exclaimed that it was little wonder that people preferred to have their pets, when in need of surgical care, operated upon in an experimental laboratory rather than in many of the established veterinary hospitals. I hope you will allow me to enter an indignant protest against the public affront which was thus put upon the veterinary profession. Even if it had been true that the majority of veterinary surgeons of the present day are as ignorant as Professor Cushing asserts them to be, the fact would not have furnished any argument in favor of the practice of vivisection with a view to the advancement of medical knowledge. But, Sir, the statement is grotesquely untrue, and it therefore deserves to be denounced as a wanton libel. Professor Cushing is an eminent surgeon, but the references to animal diseases which are contained in his address prove that he does not possess the knowledge which would justify him in sitting in judgment on the present state of veterinary science. With your permission, I will challenge him to bring in support of the view expressed in the sentence quoted above the opinion of any surgeon, physician, or pathologist whose name carries weight in Europe.

The suggestion that people in general prefer to have their pets operated upon by human surgeons needs no refutation. Perhaps, however, Professor Cushing only meant that that was the state of things in Baltimore. I am, etc., J. MCFADYEAN.

Royal Veterinary College.

MARRIED.—Dr. Ross Allen Greenwood, Painesville, Ohio, was married December 31, 1913, to Miss Katherine Lillis of that place. We wish the young couple all the happiness that the married state can bring them.

WISCONSIN STATE VETERINARY SOCIETY.—The report of the last meeting of this association reached us too late for publication in present issue. The next meeting will be held in Milwaukee, February 10 and 11, 1914.

TWINS—GIRL AND BOY were presented to Veterinarian Walter R. Pick, First Cavalry, U. S. A., Presidio of Monterey, California, by Mrs. Pick on January 12th. Further reason why the Army Veterinary Bill should pass.

COLORADO VETERINARY MEDICAL ASSOCIATION.—The association held its annual meeting in Denver, January 22 and 23, 1914, and enacted a most excellent program. Secretary Newsum's report will probably appear in our next issue.

KEYSTONE VETERINARY MEDICAL ASS'N's report of January meeting reached us too late for publication in present issue. Amongst the guests present were Drs. Chas. A. Cotton, of Minneapolis, and Dr. John Turner, of Washington, D. C.

THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION will hold its thirty-first annual meeting in Philadelphia, March 3 and 4. Secretary Reichel extends a cordial invitation in behalf of the association to veterinarians in neighboring States.

ENLISTS HIS HEARTY SUPPORT IN THE COMING YEAR.—A Michigan subscriber, in renewing, thanks us for reminding him that his subscription had expired, as he believes it the best veterinary periodical ever published and says that it has been sufficiently appreciated by him to enlist his hearty support in the coming year.

DEATH VISITS THE FAMILY OF PRESIDENT SWITZER OF THE NEW YORK STATE VETERINARY MEDICAL SOCIETY.—Within two days of each other, in the second week of January, death claimed the mother of Dr. W. B. Switzer, and the mother of Mrs. Switzer, of Oswego. The mother of Mrs. Switzer, who was Mrs. Diantha Peer Skellenger, was 85 years old, and was taken sick suddenly while visiting her son. Dr. Switzer's mother died on the same day of the month, and at the same hour as her husband, who departed this life 36 years ago. Dr. and Mrs. Switzer have the sympathy of the profession in their bereavement.

COUNTESS AN ANIMAL NURSE.—Was a cab driver and then a barber, now in a dogs' hospital. (By Marconi Transatlantic Wireless Telegraph to *The New York Times*).—Paris, December 25.—The Countess de la Gueriviere, who in 1907 appeared as the first woman cab driver in the streets of Paris, has since then twice changed her "profession."

After a brief success as a "cabby," the Countess, who at one time was very wealthy, but is now forced to earn a living, became a barber's assistant. She then opened a barber's shop on her own account, but this venture did not last long. A few months ago a third change took place and the Countess became a nurse in a Paris hospital for dogs, cats and birds.

OUR POETIC SUBSCRIBER IN GETTYSBURG AGAIN RENEWS
IN VERSE:

My subscription please renew
To AMERICAN VETERINARY REVIEW;
Enclosed my check made payable to you
You grand old AMERICAN VETERINARY REVIEW;
You are welcome to the subscription price
That is only a mere sacrifice;
Uncle Sam will bring you to my door,
So come along for the year 1914;
With a few happy hours spent in clover,
This Country Vet. will look you over.

E. D. HUDSON.

IMPORTANT TO BUYERS OF STOCK-FEEDS.—The Massachusetts Agricultural Experiment Station has just issued its Bulletin 146, Inspection of Commercial Feed Stuffs. It is the first bulletin issued under a new feeding stuffs law. The chemical analyses of about 1,000 feeding stuffs found for sale on the Massachusetts markets are shown, and in the case of mixed or compound feeding stuffs a statement of the ingredients is given.

The Bulletin also contains several pages of interesting comments on the different classes of feeding stuffs, which should be of use to every practical feeder.

The Bulletin is completed with a table of average wholesale prices of the standard feeding stuffs for each month of the year, September 1, 1912, to August 31, 1913.

The Bulletin will be sent to anyone requesting it. Address communications to

DIRECTOR, AGRICULTURAL EXPERIMENT STATION,
Amherst, Mass.

THE MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION held its seventeenth annual meeting at St. Paul, January 14th to 16th, with a most interesting program. Secretary G. Ed. Leech's report will be published in a subsequent issue.

DR. E. THOMAS DEAD.—Dr. E. Thomas, a subscriber to the REVIEW for some years, died at his home in Arlington, S. D., on January 1, 1914. A sad beginning of the New Year for his family, to whom the REVIEW tenders its sincere sympathy.

DR. MERILLAT RETURNS TO MCKILLIP VETERINARY COLLEGE.—Dr. L. A. Merillat, prominent in veterinary circles as practitioner, teacher and author of veterinary text-books, has accepted the position of professor of surgery in the McKillip Veterinary College. For the past twelve years Dr. Merillat has held the chair of surgery in the Chicago Veterinary College. Prior to that time he was connected with the McKillip Veterinary College as secretary of the institution and professor of anatomy and therapeutics, having been with that school since its inception and active in its organization. The addition of Dr. Merillat to the McKillip faculty very greatly strengthens the teaching power of the institution.

THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY held its thirtieth annual meeting in Trenton on January 8. After the business session and election of officers, luncheon was served in the dining-room of the Hotel Windsor; Mayor Donnelly of Trenton occupying a place next to President Smith at the head of the table. After luncheon the afternoon session was opened with an address from Mayor Donnelly of a very interesting character; the mayor being a man of a very fascinating personality. The papers were then presented, beginning with a most excellent one entitled "Horse Breeding in New Jersey,"* by Dr. M. A. Pierce, of Paterson. This was discussed with considerable interest. Prominent amongst the discussionists were Drs. McDonough and Rogers, of Montclair and Woodbury, respectively. Among other papers and discussions, was a talk by Dr. Wm. Herbert Lowe, of Paterson, on the tuberculosis problem. The meeting was finally closed with an instructive discussion on "Hog Cholera" by Dr. D. B. Fitzpatrick, of Philadelphia. Several visitors were also present from New York City.

* Published on page 581 of this issue.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n	June, 1914	Birmingham	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.	April, 1914	141 W. 54th St.	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n	Dec., 28-31, 1914	New Orleans, La	Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
Arkansas Veterinary Ass'n	January, 1914.	Ft. Smith.	J. B. Arthur, Russellville.
Ass'n Médéciale Veterinaire Française. "Laval"	1st and 3d Thur. of each month.	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.	2d Fri. each month.	Chicago.	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.	3d Mon. each month.	S. Omaha, Neb.	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n	Monthly	St. Joseph and vicinity	
California State V. M. Ass'n	December 10, 1913.	San Francisco.	F. W. Caldwell, St. Joseph, Mo.
Central Canada V. Ass'n	Feb. and July.	Ottawa.	John F. McKenna, Fresno.
Central N. Y. Vet. Med. Ass'n	June and Nov.	Syracuse.	A. E. James, Ottawa.
Chicago Veterinary Society	2d Tues. each month.	Chicago.	W. B. Switzer, Oswego.
Colorado State V. M. Ass'n	May 28-29, 1913.	Ft. Collins.	D. M. Campbell, Chicago.
Connecticut V. M. Ass'n	Feb. 3, 1914.	Hartford.	I. E. Newsom, Ft. Collins.
Delaware State Vet. Society	Jan., Apl., July, Oct.	Wilmington.	B. K. Dow, Willimantic.
Essex Co. (N. J.) V. M. A.	3d Mon. each month.	Newark, N. J.	A. S. Houchin, Newark, Del.
Genesee Valley V. M. Ass'n	2d week, July, 1913.	Rochester.	J. F. Carey, East Orange, N. J.
Georgia State V. M. A.	Dec. 22-23, 1913.	Atlanta.	J. H. Taylor, Henrietta.
V. M. A. of Geo. Wash. Un'y	1st Sat. each month.	Wash., D. C.	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.	Mar., 1914.	Belleville, Ill.	I. M. Cashel.
Illmo Vet. Med. Ass'n	December, 1913.	Chicago.	Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n	Jan. 14, 1914.	Indianapolis.	L. B. Michael, Collinsville, Ill.
Indiana Veterinary Association.	Pending	Indianapolis.	L. A. Merillat, Chicago.
Iowa Veterinary Ass'n	Pending	Manhattan.	A. F. Nelson, Indianapolis.
Kansas State V. M. Ass'n	Jan. 6-7-8, 1914.	Manhattan.	C. H. Stange, Ames.
Kentucky V. M. Ass'n	Oct. & Feb. each year.	Lexington.	J. H. Burt, Manhattan.
Keystone V. M. Ass'n	2d Tues. each month.	Philadelphia.	Robert Graham, Lexington.
Lake Erie V. M. Association.	Pending	Portland.	Cheston M. Hoskins.
Louisiana State V. M. Ass'n	Sept., 1914	Lake Charles.	Phil. H. Fulstow, Norwalk, Ohio.
Maine Vet. Med. Ass'n	Jan. 14, 1914.	Portland.	Hamlet Moore, New Orleans, La.
Maryland State Vet. Society.	4th Wed. each month.	Baltimore.	H. B. Wescott, Portland.
Massachusetts Vet. Ass'n	Feb. 3, 4, 1914.	Young's, Boston.	H. H. Counselman, Sec'y.
Michigan State V. M. Ass'n	Jan. 14-15-16, 1914.	Lansing.	J. H. Seale, Salem.
Minnesota State V. M. Ass'n	Aug. 29, 1913.	St. Paul.	W. A. Ewalt, Mt. Clemens.
Mississippi State V. M. Ass'n	Jan. 27, 28, 29, 1914	Starkville.	G. Ed. Leech, Winona.
Missouri Valley V. Ass'n	July, 1913.	Kansas City, Mo.	Wm. P. Ferguson, Grenada.
Missouri Vet. Med. Ass'n	Sept. 24, 25, 1913.	Kirksville.	Hal. C. Simpson, Denison, Ia
Montana State V. M. A.	1st Mo. & Tu., Dec. '13	Helena.	S. Stewart, Kansas City.
Nebraska V. M. Ass'n	Sept., 1914.	Lincoln, Neb.	A. D. Knowles, Livingston.
New York S. V. M. Soc'y	June, 1914.	Rochester.	Carl J. Norden, Nebraska City.
North Carolina V. M. Ass'n	Aug. 6-7, 1913.	Wilson.	H. J. Milks, Ithaca, N. Y.
North Dakota V. M. Ass'n	Nov. 1913.	Fargo.	J. P. Spoon, Burlington.
North-Western Ohio V. M. A.	Jan. 14, 15, 1914.	Delphos.	C. H. Babcock, New Rockford.
Ohio State V. M. Ass'n	Annually.	Columbus.	E. V. Hover, Delphos.
Ohio Soc. of Comparative Med.	Fall, 1913.	Upper Sandusky.	Reuben Hilty, Toledo.
Ohio Valley Vet. Med. Ass'n	1st Week in Feb. 1914	Oklahoma City.	F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n	Mar. 3, 4, 1914.	Toronto.	J. C. Howard, Sullivan.
Ontario Vet. Ass'n	Call of President.	Philadelphia.	C. E. Steel, Oklahoma City.
Pennsylvania State V. M. A.	4th Tues. each month.	Manila.	L. A. Wilson, Toronto.
Phillipine V. M. A.	Jan. and June.	Portland, Ore.	John Reichel, Glenolden.
Portland Vet. Med. Ass'n	Pending	Mon. and Que.	David C. Kretzer, Manila.
Province of Quebec V. M. A.	Aug. 5-6-7 1913.	Providence.	Sam. B. Foster, Portland, Ore.
Rhode Island V. M. Ass'n	1st Wed. fol. the 2d	Fillmore.	Gustave Boyer, Rigaud, P. Q.
South Carolina Ass'n of Veter'ns.	Sun. each month.	St. Louis.	J. S. Pollard, Providence.
South Illinois V. M. and Surg. Ass'n	June 17, 1914.	Reading.	B. K. McInnes, Charleston.
St. Louis Soc. of Vet. Inspectors	Pending.	Philadelphia.	F. Hockman, Iola.
Schuylkill Valley V. M. A.	Jan., Apl., July, Oct.	Madison.	
Soc. Vet. Alumni Univ. Penn.	407 Illinois Ave.	Los Angeles.	Wm. T. Conway, St. Louis, Mo.
South Dakota V. M. A.	November, 1914.	Nashville.	W. G. Huyett, Wernersville.
Southern Aux. of Cal. S. V. M. Ass'n	Nov., 1913.	College Station.	B. T. Woodward, Wash'n, D. C.
South St. Joseph Ass'n of Vet. Insp.	2d Thu. each month.	St. P.-Minneap.	S. W. Allen, Watertown.
Tennessee Vet. Med. Ass'n	Spring of 1914.	Salt Lake City.	J. A. Dell, Los Angeles.
Texas V. M. Ass'n			H. R. Collins, South St. Joseph.
Twin City V. M. Ass'n			O. L. McMahon, Columbia.
Utah Vet. Med. Ass'n			Allen J. Foster, Marshall.
Vermont Vet. Med. Ass'n			M. H. Reynolds, St. Paul, Minn.
Veterinary Ass'n of Alberta			E. J. Coburn, Brigham City.
			G. T. Stevenson, Burlington.
			C. H. H. Sweetapple, For. Saskat-chewan, Alta., Can.
Vet. Ass'n Dist. of Columbia.	3d Wed. each month.	514 9th St., N.W.	M. Page Smith, Washington, D. C.
Vet. Med. Ass'n, Geo. Wash. Univ.	1st Sat. each month.	Wash'ton, D. C.	J. M. Cashel, 2115 14th Street.
Vet. Ass'n of Manitoba.	Feb. & July each yr.	Winnipeg.	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.	January 8, 1914.	Trenton.	E. L. Loblein, New Brunswick.
V. M. Ass'n, New York City	1st Wed. each month.	141 W. 54th St.	R. S. McKellar, N. Y. City.
Veterinary Practitioners' Club.	Monthly.	Jersey City.	T. F. O'Mea Union Hill, N. J.
Virginia State V. M. Ass'n	July 9-10 1914.	Staunton.	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.	1st & 3d Fri. Eve.	Pullman.	R. J. Donohue, Pullman.
Washington State V. M. A.	June 1914.	Walla Walla.	Carl Cozier, Bellingham.
Western Penn. V. M. Ass'n	3d Thu. each month.	Pittsburgh.	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.	Feb. 10, 11, 1914.	Milwaukee.	W. W. Arzberger, Watertown
York Co. (Pa.) V. M. A.	June, Sept., Dec., Mar.	York.	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

WHY NOT SCIENTIFIC DOG FEEDING? In this age of advancement it is only proper. Besides, your clients will appreciate your interest if you will write the F. H. BENNETT Co., whose address you will find on page 26 (Adv. Dept.) of this issue, for their literature on the subject, and nearest place at which you can procure their wonderful dog, puppy, and cat foods. Mention the REVIEW when you write and insure a prompt reply.

HORSES ARE BEGINNING TO SHOW THE EFFECTS OF THE WINTER WORK and veterinarians are noticing it as they visit the stables. You know the value of molasses to the digestive system of a horse; call your clients' attention to the *Atlas Horse Feed*, the ideal *molasses ration*, and write the MEODER-ATLAS Co. yourself for literature with which to enlighten your client. Mention the REVIEW when you write and get prompt attention. See address on page 5 of this issue.

A FIRST IMPRESSION A LASTING ONE. The impression of the superiority of their preparations, and of their ideas in packing and presenting them to the purchaser, made upon the veterinarians at the A. V. M. A. convention in New York, by the Pitman-Myers Company has been a lasting one with those who have purchased and used their goods. Send them an order, no matter where you live, it will reach you in good shape, and do you good. See address on page 3 (Adv. Dept.). Send for price-lists and samples, mentioning the REVIEW, and you will get a prompt reply.

AMERICAN VETERINARY REVIEW.

MARCH, 1914.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, January 15, 1914.

GENERAL A. BARRIER, VETERINARY INSPECTOR.—A few months ago there took place in France in the organization of the ranks of military veterinarians, changes which will not be without interest to our American confrères of the Army.

Indeed, through a law passed by the Government the rank and pay of the army veterinarians were all changed; and with them the corresponding rank in grade, definitely established.

It is thus that now the conditions of those officers are designated, as their education, their duties and the services they render demanded.

The law designates that there will be one veterinary inspector, five principal veterinarians of the first class, eighteen principal veterinarians of the second, sixty-five veterinary majors of first class, two hundred of the second, two hundred and thirty-three assistant major veterinarians of first and second class, forming a total of 522—without counting those that remain yet in the Cavalry School of Saumur.

As for the rank of these various grades, the Inspector holds that which corresponds to the General of Brigade, the principal veterinarian of first class to that of Colonel, those of second class to that of Lieutenant-Colonel, the Majors of first class to that

of Major, those of second class to that of Captain and the Assistant Major of first and second class, to that of First and Second Lieutenant.

I am pleased to offer our readers the photo of General A. Barrier, with his biographic notes, showing that he deserves well to be the first Veterinary General of France.

Belonging to a family of veterinarians, his father being an old retired army veterinary surgeon and his elder brother, G. Barrier, late director of the Alfort School, at present General Inspector of the French Veterinary Schools. Alphonse Barrier was born in 1855 at Eprig, Department du Bas Rhin.

Military student at Alfort, he graduated in 1877 first of his class out of 75 candidates. He entered the class of the Cavalry School of Saumur and in 1878 came out first out of 34 candidates.

Promoted Assistant Veterinarian in 1878, was by choice made Second Veterinarian in 1881, again by choice in 1891 promoted as First, appointed Veterinary Major in 1902, Principal Veterinarian of Second Class and Director of the Veterinary Department of two Army corps in 1906, promoted Principal Veterinarian of First Class in 1910, named Chief of the Technic Veterinary Section by the Secretary of War, and Veterinary Inspector the 7th of September, 1913. In this last capacity, Barrier is permanent Inspector of the entire veterinary service of the whole Army, member of the Committee of Epizootics and of the Consulting Commission.

During his long and brilliant career, M. le General Barrier has obtained from the Secretary of War for his numerous scientific works numerous high flattering notices, several complimentary letters and a special official mention directly from the War Department.

His studies and writings on the nymphomany of mares, on ovariectomy, on the necrosis of bones, on invaginated necrosis, on the infectious pneumo-enteritis, on the morvo-farcinous infections, etc., brought him several times prizes and honors in scientific professional societies.



GENERAL A. BARRIER.
Veterinary Inspector of the French Army.

Collaborator to the Professional press of France and corresponding member of the *Société Centrale de Médecine Vétérinaire*, General Barrier is *Chevalier* in the *Légion d'honneur* and officer in the order of the *Mérite Agricole*.

*
* *
*

SARCOSPORIDIOSIS.—Although, if I am not mistaken, this subject has already been treated some time ago amongst the publications issued by the Bureau of Animal Industry, I feel that the review that Prof. Cadeac has written for the *Journal of Zootechny* will prove for our readers of great interest, giving as it does the history of the parasite and its manifestations in our domestic animals. I give it almost in full:

"Sarcosporidiosis is a parasitic disease, generally mild, of warm blooded vertebrata and is characterized by the presence in the connective tissue of sporozoars, known as sarcosporidies. These parasites can irritate the tissues infested by their presence and the toxins that they secrete.

"Discovered in 1843 by Miescher in the muscles of mice, the parasites were successively considered as alterations of the muscular fibres, as vegetal parasites or as the first stage in the development of cysticerci. In 1863, Lenckart made out their relation with microspordies, and Balbiani in 1883, classified them finally among the sporozoars under their present name. These animal parasites form the gender *sarcocystis*, in which are included all the sarcosporidies known to-day.

These organisms, sometimes visible to the naked eye, and whitish, are ordinarily elongated and sometimes globular, surrounded with a thin and delicate cuticle, sometimes with fine striae. They are divided in their inside in small lodges (sporoblasts or sporosperimes), somewhat regularly circular and distinct, containing *reniform* or *falciform* corpuscles called *sporozooids*. These fill all the lodges in the parasite, except on the level with the extremities, where there is a closed space between the

body and the cuticle. This retringent space contains small, shining elements. The sporozoids have a central nucleus and have very active motions; they may contract or spread in energetic contractions. The sarcosporidies appear first as filiform bodies, lodged in the muscular fibre or the connective tissue.

As the parasite develops, the nucleus divides in a certain number of secondary nuclei, round which is deposited the protoplasm, thus forming as many sporoblasts, which become individualized by separating travae. The presence of the parasite gives rise to the distension of the muscular fibre, whose diameter becomes double or treble the normal and stimulates round itself the formation of a reacting membrane.

"The parasite grows bigger, the sporoblasts divide and give rise to a great number of sporozoides. When the muscular fibre is entirely destroyed, the parasite drops in the connective tissue, becomes round, distended and may burst and let sporozoids escape, which will make as many parasites.

"The parasite can be studied in the infested muscles; with or without coloration, the dissociation gives almost positive results. Acetic acid at 20 per cent. makes the research easy as it reduces the color of the muscular fibre. Fresh or hardened tissues can be used, the parasite coloring easily with pierocarmine, methyl blue, gentian purple and eosine-hematoxylic.

"The entrance of the parasites in the organism is by the digestive canal. Mice fed with muscles of diseased mice are infested after forty-five days.

Feces of mice whose muscles are infested are also infesting from 13 to 50 days after ingestion. The young of infested mice are free.

"Sarcosporidies have been found in the muscles of deer, cattle, calves, sheep, horses, goats, lamas, buffaloes, rabbits, hares, monkeys, kangaroos, seals, dogs, cats, mice and rats. They have also been found in birds: crows, blackbirds, magpies, fowls. Finally, exceptionally, some fish, one reptile and even one invertebrata have been found infested.

"Considered for a long time harmless, recent studies on

horses and cattle have shown that they may give rise to cachexia, resulting in death, by their presence or their toxines.

*

* *

A FEW WORDS ON THE PATHOLOGIC SCENERY.—“*In Horses:* With them the disease is characterized by the presence of the *Sarcocystis Bertrami* in the muscles of the lips, pharynx, neck, diaphragm or other regions. It has been observed by Bergmann, Friedberger and Frohner, Moule, Siedamgrotzky, Putz, Hoflich, Hendrickx and Lienaux, Moussu and Coquot, Sabrazes, Marchal and Moratel.

“*Symptoms and Lesions:* The invasion is manifested frequently by lardaceous swellings, interstitial myositis, diffused nodosities and indurations of different parts of the body but interesting principally the fore quarters and the extremities. It is principally the subcutaneous layer of the muscle which is infested, the muscles have a pale characteristic coloration; and their inferior tendinous extremity or their aponeurosis are more affected. At any rate the parasitic infestation can attack any region of the body.

“The inferior lip is often taken and swollen. It is three times its normal size and is very rigid. Its internal face is covered with hard nodules of various sizes, projecting on its surface. The swelling of the lip spreads gradually and when the head is glanced at sideways, it has the appearance of that of a horse with purpura, thick, infiltrated and deformed.

“The tongue may be four times its size at its lower extremity, it protrudes in the lingual canal and prevents the closing of the mouth, its lateral movements are interfered with, salivation is abundant. The tongue gives the sensation of hardness well marked, it is a true ‘wooden tongue.’

“The lateral and inferior faces are rough, irregular and bosselated by the presence of parasitar nodosities, yellow-reddish with a center undergoing caseo-calcareous degeneration. In the

center of each nodosity, there is a shying spot, a dead and altered sarcosporidic surrounded with epithelial cells as in pseudo tuberculosis.

"The *surface of the body* is sometimes covered with symmetrical swellings or subcutaneous plates of various size, hard, wooden-like, painless and giving in some points the sensation of cartilaginous or calcined tissue, perhaps adherent to the skin or again not.

"The legs are stiff, moving slowly and with difficulty, flexion of the joints being very hard. The muscles of the various regions are hard and with abnormal rigidity. Some times lameness is quite marked.

"In some cases the animals lose flesh, become cachectic. In many, however, they recover, the parasites being invaded with calcification. However, the disease is not as mild as it has been supposed till late.

"Microscopic examination reveals the true nature of the nodosities.

"Iodine treatment improves but is not followed by radical recovery. Other medications are inefficacious."

*
* *
*

Ruminants—Bovines.—In cattle this disease is characterized by the presence in muscles and inter-fascicular connective tissue of the *Sarcocystis Blanchari*, whose dimensions may reach one centimeter in length. It is a rather common parasite. The heart, muscles of the eyes, the cremaster are often the seat of the parasite. In Sweden, where it is quite frequent, all cattle of two and a half years and older are affected. The oesophagus is often diseased (one case was recently recorded in the *Veterinary Record*).

The skin round the nostrils, on the face, the eyelids, the lungs, the udder, and principally the lower part of the extremities, is covered with irregular bosselated warty elevations of various

sizes, sometimes as big as a pigeon's egg. In the extremities they look like lesions of grease. Examined by the microscope, they are found consisting of an extraordinary number of parasites, rounded or slightly oval, grouped in mass, which ulcerate through the skin and enter the circulation; they are covered with a thin membrane surrounded by a cyst of inflammatory reaction.

Sheep.—The sarcosporidiosis of sheep is due to the *sarcocystis tenella*, occupying principally the oesophagus, the heart, the muscles of the eye, the connective tissue of the pharyngeal muscles, the cheeks, neck, thorax, tongue, subscapular and crural muscles, serous membranes and even the dura mater.

“Those of the connective tissue have the form of whitish nodules, sometimes as big as a hazel nut.

“The evolution of these sarcosporidies is no better known than that of the other domestic mammalia. Their pathogenous action has been much exaggerated, as they ordinarily live as harmless parasites. By exception they may become the cause of more or less extensive inflammatory lesions, with destruction of the muscular tissue, when death may follow as when the heart is affected.

Goats.—Those animals are affected like in sheep. The sarcosporidies invade the muscles and the connective tissue. They are less common but more voluminous, and as frequent in animals in good condition as well as in the cachectics. They cause no injury.

Swine.—With swine, sarcosporidies are relatively common and belong to the *Sarcocystis miescherina*. It is an elongated organism, thin at its two extremities, containing spherical corpuscles, each one filled with round and then reniform bodies. This sarcosporidie is found in the interior of muscular fasciculi, where it may develop sometimes an interstitial myositis, without rendering the meat unwholesome, when the infestation is not to a very high degree.

SILVER WEDDING OF THE PASTEUR INSTITUTE.—On the 15th of November last was celebrated the twenty-fifth anniversary of the foundation of this great institution. It was a grand occasion for all those who are partisans of the Pasteurian school to pay their grand master a noble tribute of admiration.

After a magnificent speech made by the President of the Republic, Mr. R. Poincaré, who had been a member of the Administrative Board of the Institute, the life secretary of the Academy of Sciences passed in review the general organization of the Institute and of those which were born from it and then gave the floor to the Director of the Institute who had kept for him the hard task of examining the principal scientific works which had been realized through the various laboratories of the Institute.

The long speech of Dr. Roux was a masterpiece of interesting literature, some parts of which I can only allude to in this concise article.

"If since the foundation of the Institute, Pasteur had the direction of all the entire management and of the work of all the laboratories, the Institute was poor, investigators were not wanted, capital only was very small and on that account many of those who worked at the Institute did it without remuneration, and were willing to stand great sacrifices, following the noble example given by the Master, by Pasteur himself.

"The question of immunity is of great importance in the history of infectious diseases. Pasteur had it always in his mind and was very glad to have Prof. Metchnikoff to bring to the Institute not only the prestige of his universal renown, so well justified by his researches, which have opened up new lines of investigation for embryologists and also a new doctrine of immunity.

"It is not only upon immunity that the theory of phagocytosis has thrown out new lights, but it has also illuminated pathological anatomy by new interpretation of the phenomenas of inflammation and of degeneration.

"It is in the laboratory of Metchnikoff that Bordet had dis-

covered the existence of sensibilisatrices in the serum of immunized animals. A discovery from which was born the method of the deviation of the complement, the method of Bordet and Gengau which has endowed medicine with means of diagnosis so remarkable and positive, of which the reaction of Wassermann is an ingenious and useful application.

"Another unexpected fact was also brought out from Metchnikoff's laboratory, viz.: That discovered by Vailland and Vincent, the tetanic spore as it exists in nature is alone by itself unable to produce tetanus. As soon as it is introduced in the organism it is taken up by phagocytes and to grow it needs either the protection of a foreign body or the help of other bacteria which accompany it in the ground.

"After the great discussion that followed the announcement of the phagocytose theory, Metchnikoff gave his attention to tissue degeneration, which outside of accidental infections takes place surely with the advance of age.

"And again the discovery of the bacillus of syphilis by Schaudinn and the specific treatment of Prof. Ehrlich are but the results of the researches made by Prof. Metchnikoff with his inoculations of syphilitic germs to anthropoid monkeys."

*
* *
*

But the great works of Prof. Metchnikoff are not the only ones realized in the laboratories at Pasteur's. With the modesty that characterizes the personality of Director Doctor Roux, he makes a concise allusion to his discovery and application of the anti-diphtheric serum. The bacillus of diphtheria has been signaled by Klebs-Loefler makes careful study of it, Fraenkel has immunized animals against its toxine; Behring discovers that those immunized animals give a serum which is the counter poison of the diphtheric toxine. All these facts are taken up by the staff of Pasteur's workers and after three years of labor, at the Congress of Budapest, the history of three hundred cases of diphtheria

treated with the serum with perfect success, gave the demonstration of the efficacy of the anti-toxine of Behring and admitted the new treatment of diphtheria in general practice.

The institute prepares also the anti-tetanic serum discovered by Behring and Kitasato, the antivenomous of Albert Calmette, three antitoxic sera, the anti-microbians of Ch. Richet, the anti-pestous of Yersin, Calmette and Borel, the antistreptococcic of Marmoreck, the anti-anthrax of Marchoux, the anti-meningococcic of Dopter and the anti-dysentric.

The Doctrine of Pasteur has gained its wide development; a great deal by the many branches that have been established almost all over the world. Almost every civilized country has Bacteriological Institutes, many of which were formed by missionaries issued from the mother home in Paris or sent by her to different parts of the world. The most important of those is the one of Lille in the north of France, where Doct. A. Calmette, well known in the scientific societies, is the Director and one of the most assiduous workers. Everyone knows of his investigations on tuberculosis.

In conclusion of the *compte-rendu* given in the *Presse Medicale*, Dr. F. Jayle considering from Roux the principal causes of the prosperity and success of the Institute: "One amongst those" is the constitution that directs it. It is as liberal and free as "possible. With us the importance of everyone is measured by "the services rendered and the best title to advancement is to pro- "duce good works. We admit everyone who brings an interest- "ing idea and we do not hesitate in sustaining it, even if the "work is not done with us."

*

*

*

ON CHRONIC ROARING.—Professor O. Navez, of the School of Cureghem, has published in the *Annales de Medecine Veterinaire*, of Bruxelles, a contribution to the study of the etiology of chronic roaring by laryngeal hemiplegia.

First of all he has made a résumé of the different theories ad-

vanced on the etiology of roaring. He examines successively the predisposing and producing causes, after having given a minute anatomical description of the course of the recurrent nerves. Then Prof. Navez recalls that in roaring by laryngeal hemiplegia, the muscles of the left side of the larynx innervated by the inferior laryngeal are in state of marked degeneration, and inquires into the reasons for this kind of special affinity of the left muscles of the larynx for such degenerative lesions. His conclusions are based on the anatomy and histology of those muscles and that of a certain number of nerves (pneumogastric, superior laryngeal, recurrent), which he has made upon such as taken from animals affected or not with roaring.

1. The condition of tension of the left recurrent back of the aorta must be considered as a predisposing cause of first order; the state of tension is exaggerated at each cardiac pulsation and as those pulsations are stronger in heavy draught horses and stallions than in small-sized horses and mares, it is explained why roaring is more specially observed among the first of these animals.

2. The determining cause is the degeneration of the fibres of the left recurrent, already predisposed to trophical troubles by the pullings to which it is submitted behind the aortic cross; this degeneration is accompanied by similar lesions of the posterior and lateral crico-arytenoideus and thyro-arytenoideus muscles. This change is found especially on the terminal fibres of the left inferior laryngeal of roarers; it is also noticed in the middle region of the nerve involving a less number of fibres; it is never observed in the portion situated before the cross of the aorta. It is the fact of a special affinity of the microbian toxines, secreted in the course of some diseases (sore throat, distemper, typhoid fever), which exist in the terminal fibres of a nerve, weakened already by the predisposing cause referred to above.

3. Roaring is hereditary, at least in the sense of heredo-predisposition, as long as the predisposing cause, mentioned by the Professor, is an anatomical disposition transmissible by heredity.

A. L.

THE PROFESSION REJOICES AT THE PASSAGE,
UNANIMOUSLY, OF THE ARMY VETERINARY
SERVICE BILL BY THE HOUSE MILITARY
COMMITTEE.

History is being made fast these days. Last month we quoted *The Army and Navy Journal* as authoritatively saying that the Army Veterinary Service Bill had bright prospects of passage in this session of the 63d Congress, and we stated that we had reliance in that paper as knowing what it is talking about when referring to military bills in Congress. This was borne out by the news, telegraphed to many parts of the country from Washington by Dr. Hoskins, that on February 2d the bill favorably passed the House Military Committee. That was only half the truth, for the fact is that the House Military Committee voted *unanimously* in favor of the bill. On February 2d, Drs. John R. Mohler, Adolph Eichhorn, Gerald E. Griffin, J. H. Haynes, Ingild Hansen, Jos. Hornbaker, J. C. McNeil, F. A. Bolser, J. R. Turner and W. Horace Hoskins, assisted by Messrs. Hull and Reeve, who were associated with the House Military Committee for over fifteen years, all appeared before that Committee. A full and free discussion of the merits of the bill was followed by the Committee's unanimous vote in favor of the measure with one slight modification. We advise every veterinarian who reads this editorial to write at once to his Congressman and ask him for a copy of the hearing on the bill (H. R. 4541), and the printed report of the House Military Committee on the subject. At the same time the thing to do, while you are writing to him, is to remind your Congressman of your interest in the bill to which you invite his attention and for which you ask his favorable consideration. In this way you can get a chance to read these fascinating documents and at the same time interest the Congressman in the bill.

The next step is to do everything possible to roll up a big vote for the bill when it is called up by the Speaker on the floor of the House, at the time when it is assembled as a Committee of the Whole on the State of the Union for the vote. Having been

so favorably considered by the House Military Committee, the bill will be on the calendar of that body awaiting an opportunity when it can take its turn and come to a vote on the floor. Its interests will be looked after on the floor of the House by Mr. Hay, the Chairman of the House Military Committee, who introduced it May 1st last and who ever since has made it his special, particular business to do everything for it. The duty of every veterinarian on our wide continent is now to make the most earnest appeal possible to every member of the House and Senate to support the bill in every way possible. For, in order to lose no time while this measure is waiting the hour when it shall come to a vote on the floor of the House, which will be, however, very soon, on February 2d, after the hearing before and vote of the House Military Committee, Drs. Bolser, McNeil and Hoskins waited upon Senator Kern, of Indiana, leader of the Democratic majority in the Senate and President Wilson's spokesman, and put in a strong plea for him to introduce into the Senate the same Army Veterinary Bill as is favored by Mr. Hay in the House. The appeal of these veterinarians won Senator Kern's consent. *The Army and Navy Journal*, in its issue of February 7th, accordingly announces that Senator Kern introduced the bill into the Senate, where it is known as S. 4331. Having in mind the chloroforming of our bill in the 62d Congress Sub-committee of the Senate Military Committee, our professional representatives did everything possible to avert a like disaster for the present bill. The routine of the Senate legislature work is to place such a bill as ours in the hands of a sub-committee for consideration before it comes before the whole Senate Military Committee. We wanted fair play and nothing more. Our representatives seem to have been successful, for when Mr. Kern's bill (S. 4331) was placed in the hands of the Senate Military Committee, it was by the Chairman, Senator Chamberlain, of Oregon, placed in the hands of a sub-committee where fair treatment will be given it.

From now on the hardest possible work will be necessary to carry through this legislation to final success. There will be work to be done by every veterinarian whose soul is in his profession;

to whom its progress is his very life blood. Our leaders in Tennessee, in Colorado, in New Mexico must know that the bill may yet be ship-wrecked if they do not bring pleas from all over those States upon the members of the sub-committee of the Senate charged with the first consideration of the bill for that body. Those of you who have influence you can use upon a Representative, bring it to bear upon him. Better still, those of you who can reach a Senator, especially one who is a member of the Senate Military Committee, you owe it to your profession to put your right foot forward for the purpose.

We give here the lists for your information and guidance. The House Bill is H. R. 4541. The Senate bill is S. 4331.

63D CONGRESS.

Sub-committee of the Senate in whose hands is placed the Army Veterinary Service Bill, S. 4331:

Senator Luke Lea, Nashville, Tenn., Democrat, Chairman;
 Senator Chas. S. Thomas, Colorado (Dem.), Denver, Colo.;
 Senator Thomas B. Catron, New Mexico (Rep.), Santa Fe, N. M.

Senate Committee on Military Affairs (63d Congress).—
 Chairman, Senator George E. Chamberlain, Oregon (Dem.), Portland, Oreg.; Senator Gilbert M. Hitchcock, Nebraska (Dem.), Omaha, Neb.; Senator James P. Clark, Arkansas (Dem.), Little Rock, Ark.; Senator Luke Lea, Tennessee (Dem.), Nashville, Tenn.; Senator Duncan U. Fletcher, Florida (Dem.), Jacksonville, Fla.; Senator Henry L. Meyers, Montana (Dem.), Hamilton, Mont.; Senator Charles S. Thomas, Colorado (Dem.), Denver, Colo.; Senator James K. Vardaman, Mississippi (Dem.), Jackson, Miss.; Senator Henry A. DuPont, Delaware (Rep.), Winterthur, Del.; Senator Francis E. Warren, Wyoming (Rep.), Cheyenne, Wyo.; Senator Thomas B. Catron, New Mexico (Rep.), Santa Fe, N. M.; Senator James H. Brady, Idaho (Rep.), Pocatello, Idaho; Senator William S. Kenyon, Iowa (Rep.), Fort Dodge, Iowa; Senator Nathan Goff, West Virginia (Rep.), Clarksburg, W. Va.; Senator Joseph L. Bristow, Kansas (Rep.), Salina, Kansas.

G. S.

HOUSE BILL 9292.

This bill, which was published on page 653 of the February issue of the REVIEW under the head of *The Lobeck Classification Bill for B. A. I. Employees*, and also referred to editorially on page 552 of the same issue, under caption *The Lobeck Bill*, is worthy of the consideration of every veterinarian in the country, as it recognizes the worth of the veterinarian in the field of sanitary medicine and as an important factor in a safe food supply. That is a national recognition in every sense of the word. A recognition that *every* veterinarian, no matter in what field he labors, desires and *must* help to establish.

The benefits that this bill will bestow upon the veterinarians in the B. A. I. service, and the resultant advantages to the Federal Government, were set forth editorially in the February REVIEW, in addition to the publication of a copy of the bill itself; and all veterinarians are further urged at this time to write their respective congressmen and senators, calling their attention to the objects and merits of H. R. 9292 and soliciting their favorable consideration of it. Refresh yourselves on the objects of the bill by referring to the February REVIEW, and you can obtain a copy of it for yourselves by requesting it from your congressman or senator when writing him. For your further information and guidance we have published on page 789 of this issue a list of the representatives in the different states, and their addresses, which have been furnished us by Dr. S. J. Walkley, secretary of the NATIONAL ASSOCIATION BUREAU OF ANIMAL INDUSTRY EMPLOYEES, whose interest in the bill has been so well demonstrated to the national body that its executive committee has seen fit to appoint him the representative of the association at Washington while the bill is pending. Dr. Walkley has suggested, in addition to veterinarians communicating with their representatives at Washington, that any veterinary students at the veterinary colleges write to the representatives from their homes, letting them know that they are interested in it, in as much as that, if it becomes a law, it will provide for reasonable com-

pensation for them, should they enter the government service in the B. A. I. Dr. Walkley also suggests that any one learning from interviews or correspondence that any particular congressman or senator does not manifest the proper interest in H. R. 9292, or is even lukewarm regarding it, will kindly report that fact to his office, which is 185 Northwestern avenue, Milwaukee, Wis. That is an excellent suggestion, as Dr. Walkley will be in Washington when the bill comes up for action and can direct all the influence possible towards those particular representatives. As a last word, refer to page 789, and act *promptly—at once*.

VETERINARIANS AND HORSE BREEDING.

We have always been strong advocates of careful and thorough instruction in breeding problems at veterinary schools, believing that the veterinarian is the logical person for the scientific direction of the breeding of domestic animals. We have also encouraged veterinarians to take an active part in the consideration of such problems wherever possible to do so, and to discuss plans amongst themselves through articles in veterinary periodicals, thereby broadening each other's knowledge on this all-important subject, which the agricultural and breeders' journals are now conceding to the veterinarian as his logical work. We quote from *The Live Stock Journal*, Chicago, in support of this statement. In its January number it says: "Expert veterinarians who understand the principles of breeding should promote horse breeding, encourage and assist the farmers in getting better, pure-bred stallions to drive out the grade scrub and unsound stallions that will make horse breeding more profitable, with big, sound geldings and big farm teams, the greatest prosperity of the farm." We also publish on page 787 of the present number a resolution passed at the recent meeting of the New York State Breeders' Association at Rochester, covering practically the same points mentioned by *The Live Stock Journal*.

That resolution was sent to the REVIEW, with a request for its publication by a veterinarian whose interest and enthusiasm along those lines is known to every veterinarian in his state, where he has repeatedly introduced similar resolutions before the state veterinary organization. We refer to Dr. Walter G. Hollingworth. And at the same meeting of the Breeders' Association, where the resolutions referred to were presented, Veterinarian Carl W. Gay, author of "Productive Horse Husbandry, professor on breeding at the veterinary school of the University of Pennsylvania, and an authority on breeding problems, gave an address on "*Market Horses*," and Veterinarian John F. De Vine, consulting veterinarian to the N. Y. State Department of Agriculture and lecturer on cattle diseases at the New York State Veterinary College at New York University in New York City, gave an address on "*Some Common Diseases of Domestic Animals and Their Treatment*." Dr. N. S. Mayo's enthusiastic account of the close relationship between the stockman and the veterinarian in Minnesota, on page 785 of this issue of the REVIEW, and Dr. M. A. Pierce's article entitled "*Horse Breeding in New Jersey*," on page 581 of the February REVIEW, are further evidences of the fact that the veterinarians of this country are gradually taking their places as directors and guides in stock-breeding questions, the most important industry in this country. We are informed by those conversant with the facts that European veterinarians are regarded as authorities on horse breeding, and the REVIEW hopes to see the day when the same will apply in this country; as we believe that it will mean not only the elimination of the scrub and unsound sire, that are such a menace to universal interests, but will tend to overcome other conditions that are responsible for the dearth of horses that exists to-day. The resolution referred to from the New York State Breeders' Association shows that in that state it requires 80,000 horses outside of those bred in the state to supply the demand each year, at a cost of \$20,000,000; and we assume the same thing applies to a greater or less degree in other states. The production of those 80,000 horses is a pretty nice industry in itself, and that

multiplied by similar necessities in other states throughout the nation must aggregate a tremendous shortage in the demand for horses in this country, and should, as *The Live Stock Journal* says, receive the assistance and encouragement of the skilled veterinarians who understand the principles of breeding, and their assistance to the farmers to overcome it. Let them present ideas and suggestions for each other's criticism in veterinary literature, with the object of rounding out plans for the improvement and advancement of horse breeding. The REVIEW's pages are at their disposal, and do not think for a moment that these plans will escape the attention of horse breeders because appearing in a veterinary paper, as they are watching veterinary literature very closely for just such matter. The veterinarians in New York State also have a specific duty to perform in seeing that the present legislature enacts a Stallion Service Law along the lines suggested in the resolution adopted by the Breeders' Association, and the veterinarians of all other states that have not a proper law regulating stallion service, have a similar specific duty which they must not overlook.

ADDENDUM.—After the above was in type, we received from Collaborator DeVine, an article entitled *Breeding of the Proper Type of Horses Should be Encouraged*. This article, pithy and to the point, is published on page 728 of this issue.

TENTH INTERNATIONAL VETERINARY CONGRESS, LONDON.

Under the caption of *Official Tour of Europe of the American Veterinary Medical Association*, editorially, in our February issue we referred to the dates of the INTERNATIONAL VETERINARY CONGRESS IN LONDON as August 3 to 8 (in fact, we published the dates and an outline of the programme last summer), and this month, on page 778 we are publishing a preliminary programme, furnished by Sir Stewart Stockman, Honorary Secretary of the Congress. This programme also contains the names

of the reporters, as they term them, on each subject, some 85, representing all the countries of the world, the names of eight from our own country being amongst them. We have not found it possible to publish these names at this time, but will give them space in a later issue. We are proud of the number and character of the representation from the United States, and feel sure that their presence at the Congress will impress the older countries with the advancement, the dignity and *morale* of American veterinary medicine; and we feel sure that when the Tenth International Veterinary Congress becomes a matter of history, our colleagues of the older countries will be fully convinced through the information that American veterinarians possess on the subjects contained in the programme, that their interests are keenly alert on all phases of veterinary science. And we are certain that their interest and alertness, while mingling with the great scientists of Europe and other parts of the world, is going to be of incalculable benefit to veterinary science in this country. We would therefore urge every American that can possibly do so to attend the International Veterinary Congress in London in August next. Let the American delegation be impressive in numbers as well as in its personnel. The visits to noted studs and the royal herds at Windsor, mentioned by Sir Stewart Stockman under the head of entertainment in the programme, is very inviting. Another point that he touches upon that should receive prompt attention, even from those who cannot see their way clear to attending the Congress, is that of membership. All those desiring to become members of the Congress, irrespective of whether their intentions are to attend or not, may do so by sending \$5 to Dr. Adolph Eichhorn, at Washington, D. C., who will see that it gets into the hands of the Honorary Treasurer and that the subscriber is duly enrolled a member and properly receipted. The programme instructs you to send your subscription to the Honorary Treasurer, Mr. F. W. Garnett, J.P., M.R.C.V.S., No. 10 Red Lion Square, London, W. C., but the Honorary Treasurer is perfectly willing to receive the subscriptions in bulk from the National Secretary of each country, and it is much simpler

for us here to send it to Dr. Eichhorn, who holds that position for the United States. Another very important thing for Americans, important to themselves because it affects their comfort, is that everyone whose intention it is to attend the Congress notify Dr. Eichhorn of the fact, as it would seem to be of material advantage to representatives of the United States to engage rooms in a selected hotel that may be used as headquarters for the American representatives; and in order to perfect these arrangements, Dr. Eichhorn, who, as Secretary of the National Committee of the United States, represents you, will want to know how many he shall arrange for at the earliest possible moment. Give these last two matters of membership and intention to attend your immediate attention. Then, Ho! for London in August!

VETERINARIANS FROM FIFTEEN STATES AND THE DISTRICT OF COLUMBIA attended the special course for licensed veterinarians at School of Veterinary Medicine, University of Pennsylvania, in January. We stated in our February issue that 79 veterinarians had responded to the announcement made in our December number of the special course referred to above, and in correcting that statement will say that that was what we were told; but through the courtesy of our esteemed confrere, Dr. Charles E. Cotton, of Minneapolis, we have since seen the list of names of those in attendance, which numbers eighty-five (85). Forty-three (43) were alumni of the school, twenty-eight (28) were graduates of other schools, and fourteen (14) were non-graduate practitioners. Every one attending was enthused and went home feeling amply repaid, and with the determination to return whenever the school would give a similar opportunity. They appreciated to the full the earnest effort on the part of each professor to give all that he could in his branch, in the time allotted him. As a token of their appreciation the gentlemen presented the school with a memorial in the form of a picture of Dr. Simon J. J. Harger, professor of anatomy, to be placed in Leonard Pearson Hall. We congratulate the Veterinary School of the University of Pennsylvania on the success of its project, and we also congratulate the American veterinary profession on the ambition of its members for something more than mere dollars: an ambition for greater knowledge in the great science which they have made their life study.

ORIGINAL ARTICLES.

STUDIES ON THE VIRUS OF HOG CHOLERA.

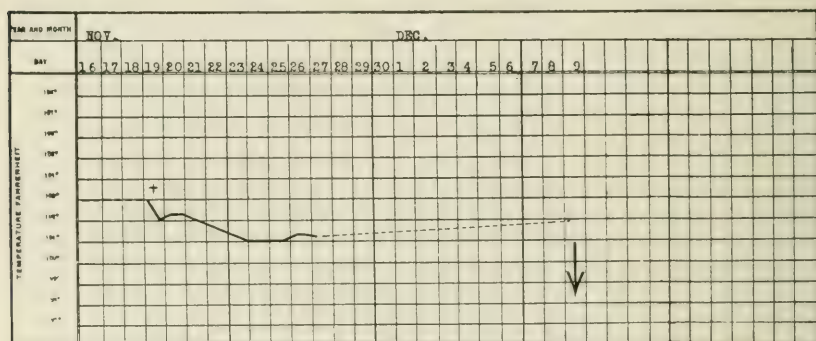
BY WALTER E. KING, F. W. BAESLACK, AND GEORGE L. HOFFMANN, DETROIT,
MICHIGAN, RESEARCH LABORATORY, PARKE, DAVIS & Co.

(Continued from Last Issue.)

Indiana strain of virus—This virus was secured from Mr. Delplane and was originally supplied by Dr. R. A. Craig, who reported that this strain was secured by him in the field some time ago and did not represent the B.A.I. strain of virus.

Hog 501 was inoculated with 5 c.c. of Indiana I virus on November 7, after having made a dark field examination of the nor-

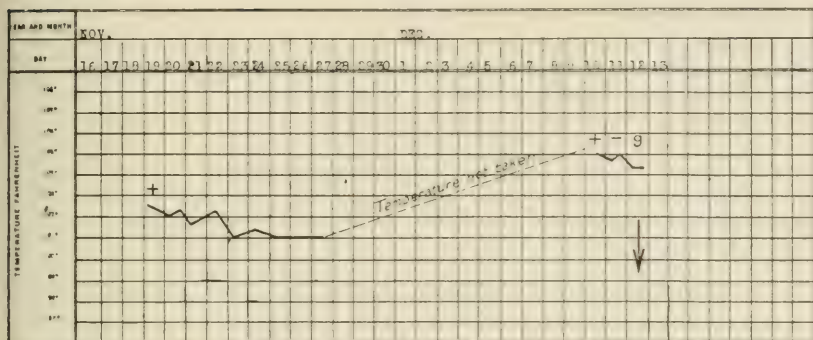
Hog No. 509. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



REMARKS: November 16. Rochester pig. Not inoculated.
November 20. Symptoms of chronic type.
December 9. Animal found dead.
Lymphatic glands, lungs, spleen, heart muscle, and kidneys show typical lesions.

mal blood. On the seventh day after inoculation the spirochete was found in the blood of this animal, although symptoms, with the exception of a beginning rise of temperature, were not ob-

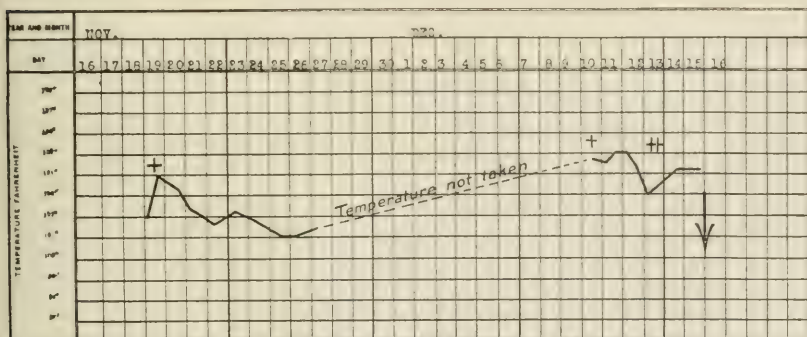
HOG No. 510. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



REMARKS: November 16. Rochester pig. Not inoculated.
 November 20. Symptoms of subacute type.
 December 10. Animal very weak and emaciated.
 December 12. Animal moribund, bled and examined.
 Spleen, lymphatic glands, and cecum show typical lesions of cholera.

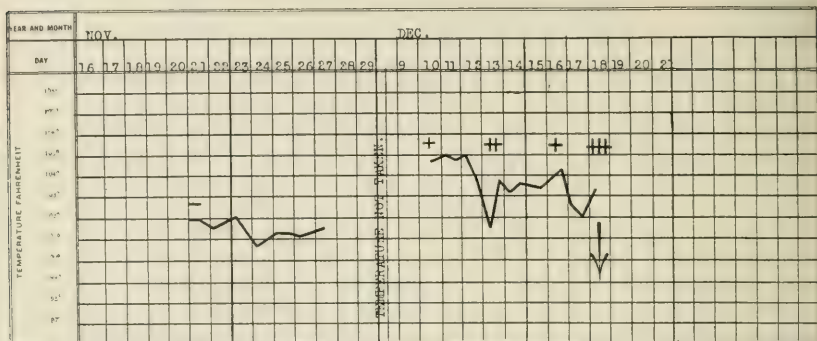
served until the following day. Attention should be called to the fact that on the ninth day after inoculation no spirochetes could be found in the blood, but characteristic granules were present, while on the tenth day the spirochete was again found. This phenomenon, observed in other cases as well, suggests that the

HOG No. 511. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



REMARKS: November 16. Rochester pig. Not inoculated.
 November 20. No marked symptoms, looks fairly good.
 December 1. Symptoms of subacute type.
 December 10. Animal very weak and emaciated.
 December 16. Found dead.
 Typical lesions, lymphatic glands, kidneys, lungs, and cecum.

HOG No. 513. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.



REMARKS: Rochester pig, not inoculated.

November 20. No marked symptoms, but not doing well.

December 5. Subacute or chronic case.

December 10. Animal weak and emaciated.

December 18. Animal moribund, bled and examined.

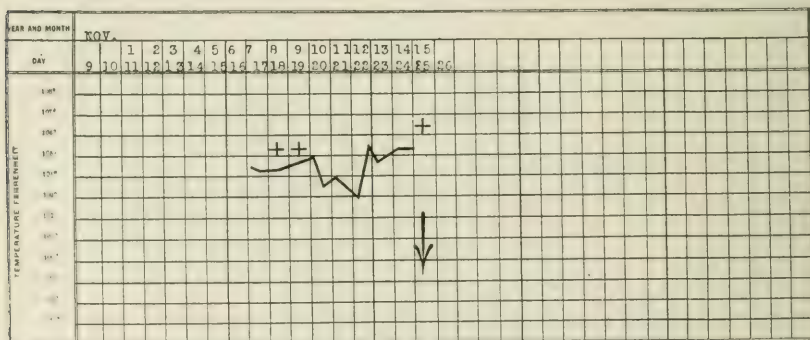
Lungs, heart muscle, lymphatic glands, kidneys, and cecum show typical lesions.

spirochete under observation represents one stage in the life cycle of the organisms, and that the granule formation is possibly an important factor in its development.

California (Hall) strain of virus—Dr. Ivan C. Hall of California supplied this virus and the following history:

“We have just bled a hog originally injected with a virus ob-

HOG No. 514. MICHIGAN (ROCHESTER) STRAIN OF VIRUS.

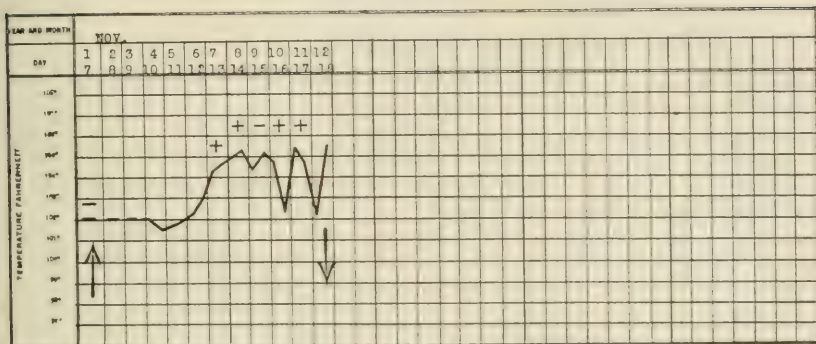


REMARKS: November 9-11. Rochester pigs were placed with this hog, which was normal.

November 25. Animal moribund, bled and examined.

Typical lesions, lymphatic glands, kidneys, lungs, and spleen.

HOG No. 501. INDIANA I STRAIN OF VIRUS.

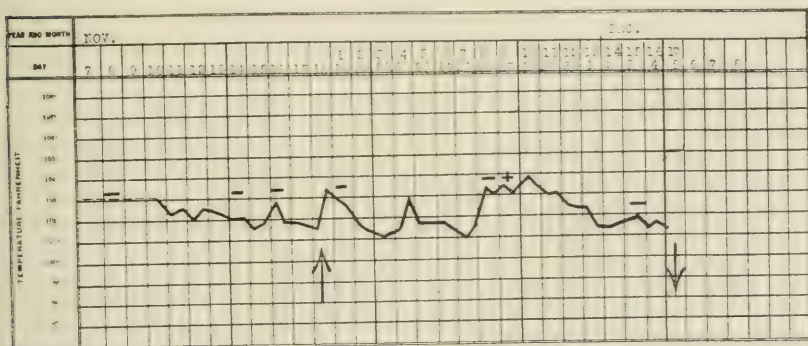


REMARKS: November 7. Inoculated with 5 c.c. of Indiana I Virus.
 November 12. 4 P.M. Animal showed symptoms.
 November 18. Animal moribund, bled and examined.
 Purple areas of discoloration on abdomen, nose, and ears.
 Subcutaneous blood extravasations. Lymphatic glands enlarged and hemorrhagic. Both kidneys petechiated and contain retention cysts. Hemorrhagic areas in heart muscle, lungs practically consolidated in both upper and lower lobes. Ulcers in cecum.

tained from one of our California towns. This virus was injected after being filtered and proven bacteria free, as it originally contained a pure culture of *B. cholera suis*.

"The hog became very sick about 10 days after and, appear-

HOG No. 502. CALIFORNIA (HALL) STRAIN OF VIRUS.



REMARKS: November 18. Inoculated with 15 c.c. California (Hall) virus (diluted 1:4) and filtered through Berkefeld.
 November 26-30. Slight symptoms.
 December 3. Animal apparently normal.
 December 5. Animal killed by large male Hog No. 400. No lesions.

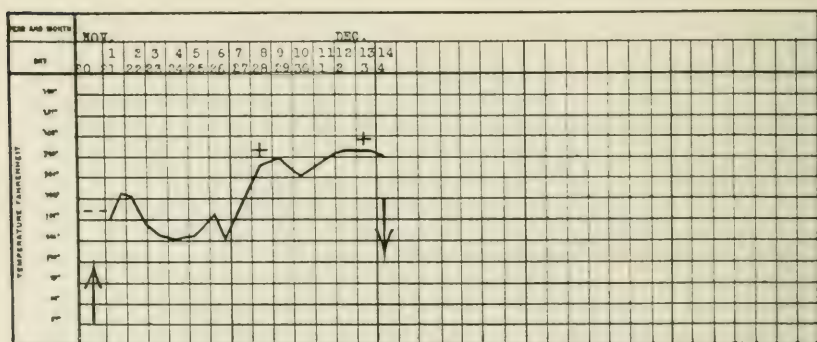
ing moribund, we bled him to death. The virus which I am sending you is some of this, after it had been diluted to one part in four and filtered through a Berkefeld filter."

Hog 502, which received the above strain of virus, had been kept for several days as a control on the isolation of the experiments and on the dark field examinations of the blood of normal and diseased hogs. Nine days after inoculation this animal exhibited mild symptoms of hog cholera, with temperature of 103.5° F. The spirochete was found in its blood. Fifteen days after inoculation its blood was free from spirochetes and characteristic granules. On the 17th day it was killed by large male Hog 400, and at autopsy no pathological lesions could be found.

Ohio (Pettigrew, Hazen and Heinz) strains of virus—The viruses, obtained through the kindness of Dr. Paul Fisher and Dr. A. D. Fitzgerald, were taken from three different outbreaks and represented mixtures of blood samples from the number of pigs indicated on the labels. Ohio (Pettigrew), Ohio (Hazen) and Ohio (Heinz) represented mixtures of virulent blood from three, five and six pigs respectively.

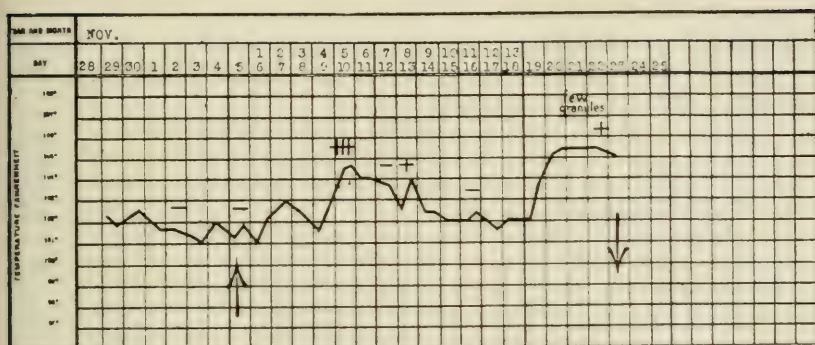
A dark field examination was made of the undiluted Ohio

HOG No. 515. OHIO (PETTIGREW) STRAIN OF VIRUS.



REMARKS: November 20. Inoculated with 15 c.c. filtered (Pettigrew) Ohio virus, diluted with normal saline 1-4.
 November 29. Animal quite sick.
 December 4. Animal moribund, bled and examined.
 Spleen, kidneys, lymphatic glands, liver, lungs, and cecum show typical lesions.

HOG No. 521. OHIO (HEINZ) STRAIN OF VIRUS.



- REMARKS: December 2. Hog in good condition.
 December 5. Inoculated with 15 c.c. Ohio (Heinz) virus, Berkefeld filtered and diluted 1-4.
 December 10. Symptoms appeared.
 December 15. Condition of animal improving.
 December 19. Animal suffered relapse.
 December 23. Animal died.
 Ventral surface of body deep purple color. Extravasations in subcutaneous tissue. Inguinal glands large and hemorrhagic. Lungs, both involved in all portions, highly congested, partially consolidated in small areas. Bronchial tubes filled with exudate. Heart, petechiae in auricles and the heart muscle. Both kidneys show small petechiae. Liver, passive congestion. Mesenteric and retroperitoneal and inguinal lymph glands enlarged and hemorrhagic. Cecum shows ulcers.

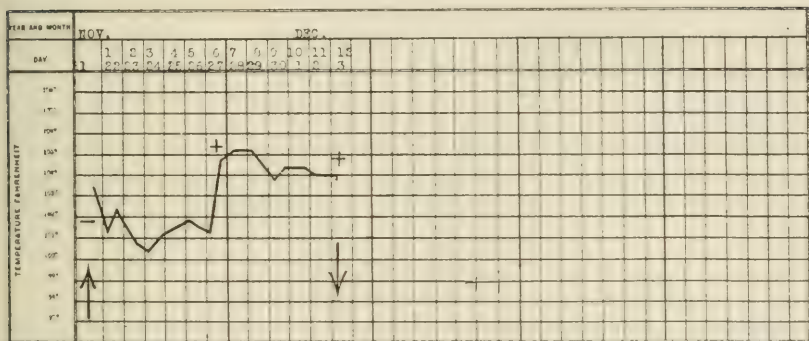
(Pettigrew) virus, as found in the original container, and one spirochete was observed.

The spirochetes were found in the blood of hogs inoculated with all three strains of Ohio virus, as shown on the following charts. The blood of Hog 521 (Ohio, Heinz strain) on the fifth day after inoculation contained relatively numerous spirochetes. On the seventh day none could be found, while on the eighth day the organism was readily found. By the eleventh day the clinical condition was much improved and the findings were negative, but the animal suffered a relapse, and on the day of death the organisms were again present in the blood.

Hog 525, inoculated with the Ohio (Hazen) strain of virus, manifested symptoms on the fifth day after inoculation, and on that day the findings were positive. This animal is now fully recovered and no spirochetes are present in his blood.

Kansas I strain of virus—Professor L. D. Bushnell supplied

HOG No. 516. KANSAS I STRAIN OF VIRUS.

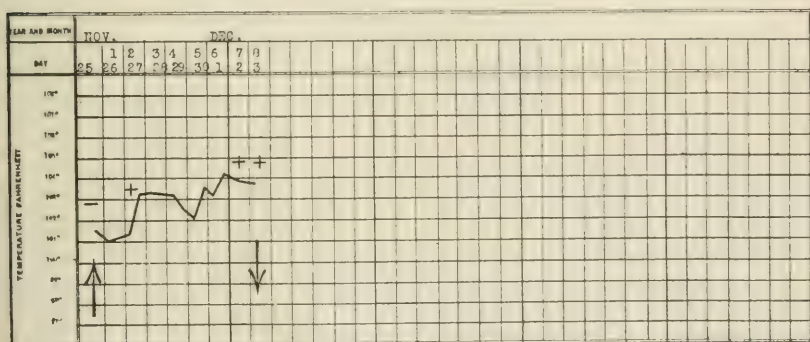


REMARKS: November 21. Inoculated with 4 c.c. Berkefeld filtered Kansas I virus.
 November 29. Animal very sick.
 December 3. Animal moribund, bled and examined.
 Typical lesions, marked in lymphatic glands, kidneys, cecum, spleen, and lungs.

spirochetes were observed. The blood of Hog 516 inoculated with this virus showed the presence of the spirochete.

Unknown strain of virus—On November 25 and 26, Hogs 517 and 518 were inoculated with California (Hall) and California (University) strains of virus respectively. Before inocu-

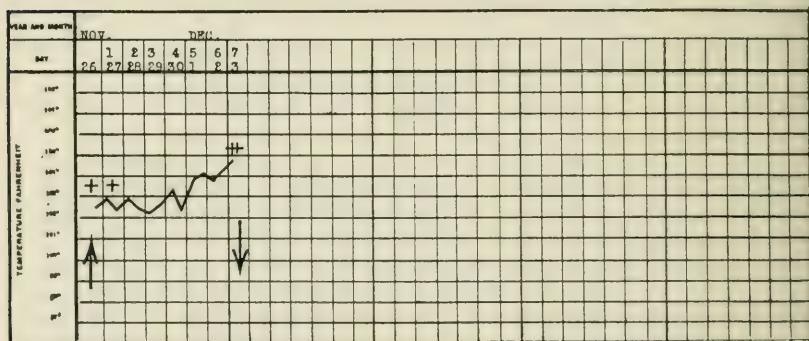
HOG No. 517. UNKNOWN STRAIN OF VIRUS.



REMARKS: November 25. Inoculated with 15 c.c. California (Hall) virus, Berkefeld filtered and diluted 1-4.
 November 26. Animal shows symptoms, evidently due to previous natural exposure.
 December 3. Animal moribund, bled and examined.
 Cecum, lymphatic glands, spleen, kidneys, and lungs show typical lesions.

lation, blood from these apparently normal animals was collected in sterile sodium citrate solution for control examination. In the case of Hog 518 the dark field examination of the assumed normal blood revealed the presence of the spirochete. Subsequent developements clearly indicated that these animals were in some way exposed to the disease before inoculation, as clinical evidences of the disease were clearly present in both cases within a day or two following inoculation, an interval of too short duration

HOG No. 518. UNKNOWN STRAIN OF VIRUS.



REMARKS: Inoculated November 26, with 15 c.c. University of California virus, filtered and diluted 1-4.

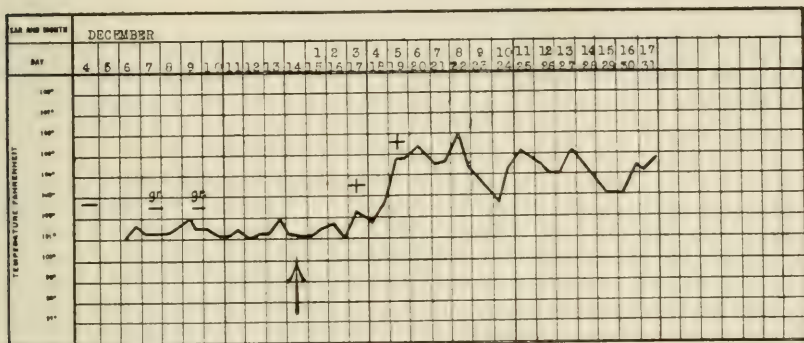
November 28. Not eating well, red spots on ventral surface of body. Probably infected with natural exposure previous to inoculation.

December 3. Animal moribund, bled and examined. Small blood extravasations in muscular and subcutaneous tissue. Spleen slightly enlarged, dark gorged with blood. Capsules of both kidneys loosely adherent, and both kidneys filled with small urinary cysts. Both lungs show areas of consolidation. Inguinal and mesentery glands enlarged and hemorrhagic. Ulcers present in cecum.

to correspond with the incubation period which should follow the injection of virus. Moreover, Hogs 517 and 518 were both in a moribund condition, eight and seven days respectively, following the inoculation, periods relatively shorter than the average duration of the course of the disease of cases included in this work.

California (University) strain of virus—Dr. C. M. Haring and Dr. F. J. Mitchell kindly furnished this specimen of virus. The history of the material follows: "This particular virus I am sending comes from an outbreak of a not severe type, but the

HOG No. 524. CALIFORNIA (UNIVERSITY) STRAIN OF VIRUS.

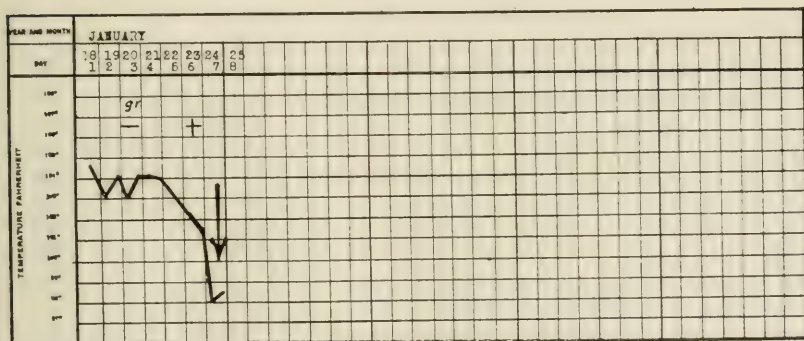


REMARKS: December 4. Susceptible pig; fine condition.
 December 14. Inoculated 15 c.c. California (University) virus, Berkefeld filtered and diluted 1-4.
 December 18. "Off feed." Symptoms appeared.

virus has been killing pigs now in from seven to twelve days for the last four months. Pigs showed petechiae in the lungs and kidneys, very few on the intestines. Ulcers are sometimes present, sometimes not."

This strain of virus was injected into Hog 524 after having established three negative dark field examinations of his blood. As shown on the chart the spirochetes were observed at three different times during the course of the disease. Again, in this

Hog No. 524—Continued.



REMARKS: January 8. Found dead.
 Typical lesions, lungs, liver, kidney, spleen, cecum, inguinal glands, large intestine, and subcutaneous tissue.

case, the spirochete was found about 24 hours before any clinical symptoms or rise of temperature occurred.

Michigan (Rochester II) strain of virus—On January 10, 1913, 15 apparently normal hogs were received from Rochester, Mich. These pigs, averaging about 40 pounds in weight, while not in thrifty condition, did not appear to be diseased.

On January 11, dark field examinations of the blood of two of these animals revealed the presence of the spirochetes. The temperatures of these two animals were each 103.8° F. and a tentative diagnosis of the chronic type of cholera was made. On January 13, three days after the receipt at the laboratory, the temperatures of seven of the 15 animals ranged between 104° and 105.5° F. and, from other symptoms, there was no doubt but that the diagnosis of cholera was correct. Investigation showed that on January 1 these animals were placed under such conditions that exposure to hog cholera might result. As they were received at the laboratory on January 10 and symptoms definitely established by January 13, there existed a period of incubation corresponding to that usually present in the chronic or subacute types of cholera.

These animals are under observation at the present time. A summary of the dark field findings is presented in the following table:

TABLE I.
Michigan (Rochester II) Strain of Virus.

Hog.	Number Dark Field Examinations to Date.	Presence of Spiro- chete in Blood.	Remarks.
537.....	3	+++	Temp. range from 102. — 104.8° F.
538.....	3	+++	" " " 101.2—104.1 "
539.....	3	+++	" " " 102.2—105.5 "
540.....	1	—	" " " 101.6—103.5 "
541.....	1	+	" " " 101.6—103.2 "
542.....	3	+++	" " " 102. — 104.6 "
543.....	1	+	" " " 102. — 103.5 "
544.....	2	++	" " " 102.4—105.5 "
545.....	1	—	" " " 101.8—103. "
546.....	1	—	" " " 101. — 104.5 "
547.....	2	—	" " " 101.5—103. "
548.....	2	++	" " " 102. — 105. "
550.....	1	—	" " " 101.5—103. "
551.....	1	—	" " " 102. — 103.5 "
512.....	1	—	" " " "

DARK FIELD EXAMINATIONS OF THE BLOOD OF NORMAL HOGS.

In addition to the control examinations which were made in practically all cases, as shown on the charts above, additional data relative to negative findings in normal blood have been secured.

TABLE 2.

Dark Field Examinations of the Blood of Hogs not Suffering from Hog Cholera.

Hog.	Number Dark Field Examinations.	Spirochete Present or Absent.	Condition of Animal.		
522.....	2	---	Normal		
512.....	2	---	"		
523.....	1	---	"		
526.....	2	---	"		
519.....	2	---	"		
520.....	2	---	"		
527.....	3	---	"		
528.....	1	---	Infested with Ascaroides		
529.....	2	---	"	"	"
530.....	1	---	"	"	"
531.....	1	---	"	"	"
532.....	1	---	"	"	"
533.....	1	---	"	"	"
534.....	1	---	"	"	"
535.....	1	---	"	"	"
536.....	1	---	"	"	"
400.....	1	---	Natural immune		
553.....	2	---	Normal		
554.....	2	---	"		
555.....	2	---	"		
556.....	2	---	"		

A number of hogs, planned for material to be used in the work, became badly infested with intestinal parasites (chiefly *Ascaroides suella*) and were not utilized except for control blood examinations.

Some of these animals exhibited temperatures as high as 106° F. at the time of the dark field examinations. The negative findings in these cases, therefore, present valuable data in that they show that the presence of the spirochete, observed in the blood of animals suffering from cholera, does not depend merely upon a febrile condition of the blood.

Several immune hogs not included in the above data also served as donors of normal blood specimens. These additional negative findings in the blood of hogs not infected with hog cholera are shown in Table 2.

HORSE SERUM VIRUS PHENOMENON.

Horse serum virus may be produced by securing blood from a horse one to two hours after the animal has received an intravenous injection of approximately 150 c.c. of virulent hog cholera serum. The character of this material and the results of experiments, which demonstrate that it is not a mere dilution of hog cholera serum, have been reported in former publications.¹¹ It may be concisely stated that hog cholera virus undergoes some inexplainable process of activation after approximately one hour's residence in the circulatory system of the horse.

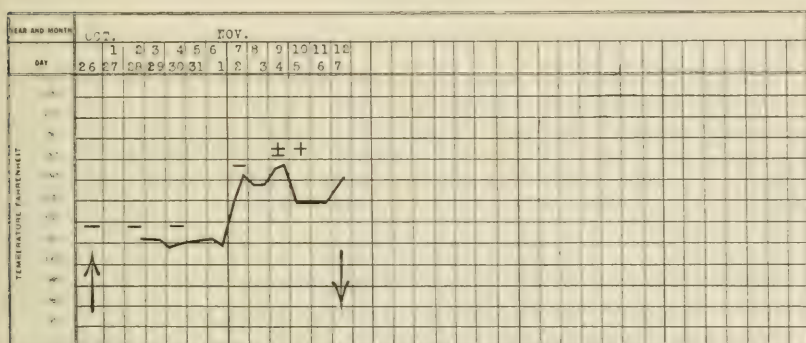
On October 25 the blood of Horse 1 was examined on the dark field. Nothing other than erythrocytes, leukocytes and some blood dust was noted. At 1.45 P. M., on October 25, Horse 1 was given an intravenous injection (jugular vein) of 150 c.c. B.A.I. strain of virus. A specimen of this hog cholera serum was examined on the dark field and no spirochetes were found, although the material did contain many characteristic granules. The animal was led from the stocks and immediately became groggy and weak, the pulse was weak, respiration labored, eye dull and listless and peristalsis violently active. The animal became covered with a profuse cold perspiration and frequent watery evacuations followed. Three-fourths of an hour after the injection of the horse it was bled under aseptic conditions and the blood examined by dark field illumination. The spirochetes were found with ease, six organisms being found in a few minutes. Blood drawn from the horse one and three-fourths hours after injection also contained the spirochete when examined on the dark field. The one and three-fourths hours virus also contained a marked increase in the number of granules. A specimen of the blood of Horse 1 drawn two and three-fourths hours after injection upon careful dark field examination revealed only granules and refractive bodies—no spirochetes could be found.

The virulence of the three-fourths-hour horse serum virus which the above animal yielded was tested by the inoculation of Hog 4501. The result of this animal inoculation conformed

with extensive data previously reported, in that the hog became the subject of a more acute type of cholera after a relatively short period of incubation, as compared with the average case following the injection of hog cholera serum itself.

On November 22, Horse 2 was utilized in duplicating the above experiment, after establishing a normal condition of the blood in so far as absence of spirochetes was concerned. This

HOG No. 4501. B.A.I. STRAIN OF VIRUS. HORSE SERUM VIRUS.



REMARKS: October 26. Inoculated with 4 c.c. activated horse serum virus.

November 2. Symptoms appeared.

November 7. Animal found dead and examined.

Many subcutaneous blood extravasations. Muscle of right ventricle contains blood extravasations. Lower lobe left lung consolidated. Areas of red hepatization in upper lobes of both lungs. Spleen soft, dark, and gorged with blood. Kidneys show numerous petechiae. Large ulcer near ileocecal valve. Extensive areas of congestion in intestinal mucosa. Lymphatic glands enlarged and hemorrhagic.

animal was injected intravenously with 180 c.c. of B.A.I. and Indiana I strains of virus mixed. The symptoms were of the usual character, but were more retarded and less pronounced than those recorded in the first experiment with Horse 1. In our experience,¹² more pronounced reactions following injection and more uniform horse serum virus result, when the animals have been subjected to one or more repeated injections with the hog cholera virus, a condition in all probability not depending upon anaphylaxis as shown by previous results. Horse 1, above, had

been repeatedly used on the work; Horse 2 had never been subjected to the treatment before.

The three-fourths-hour horse serum virus of Horse 2 showed the spirochetes on the dark field. In the two-hour virus only one spirochete could be found.

The above data must be verified by repeated experiments. However, assuming that the spirochete under observation, in different stages of its life cycle, might represent the etiological factor in hog cholera, it would not be impossible to explain the horse serum virus phenomenon by the results obtained above.

SUMMARY.

The results may be summarized as follows:

1. Dark field examinations of the blood of 48 hogs, all normal, excepting some which were infested with intestinal parasites, have revealed no spirochetes. All of these specimens have been relatively free from granules, with the exception of some instances, when it was usually possible to determine that the granules were liberated from crushed leukocytes.

2. The examination of the blood of all hogs—40 animals—which were suffering from hog cholera, revealed the presence of a spirochete. All specimens of blood from these animals, during the height of the disease, contained characteristic granules.

3. Negative dark field findings followed positive findings in the case of six hogs which recovered from the disease.

4. The blood of two naturally immune hogs was free from spirochetes and granules.

5. The spirochetes and granules have been observed in hogs infected with 12 different strains of virus, as follows: B.A.I., Michigan (Demerick), Michigan (Rochester I), Indiana I, California (Hall), Ohio (Pettigrew), Ohio (Hazen), Ohio (Heinz), Kansas I, Unknown, California (University), and Michigan (Rochester II).

6. Hog cholera was diagnosed in two small herds of hogs after receipt of the animals at the laboratory, by means of the

dark field examination of the blood. In other instances, positive dark field findings were secured a few hours before any symptoms appeared.

7. The spirochetes were found with less difficulty in the blood of hogs suffering from the acute form of the disease.

8. In two experiments the spirochetes were demonstrated in horse serum virus.

9. Spirochetes are uniformly demonstrable in the intestinal ulcers of hogs dead from cholera.

CONCLUSIONS.

Without cultures with which to inoculate susceptible animals it is, of course, impossible at this time to definitely ascribe to the spirochete under observation any pathogenic properties or etiological significance. Nevertheless, careful consideration should be given to the results which are consistent and uniform throughout, and which, in some particulars, strongly suggest the relationship of this spirochete to hog cholera, as a causative factor. As this organism has not been previously reported and described the name *Spirochaeta suis* may properly be suggested.

REFERENCES.

11. King and Wilson, *Bull. Kansas Exp. Sta.*, 1910, No. 171. *Jour. Infect. Dis.*, 1912, 11, p. 441; *Ztschr. f. Immunitätsf. u. Exp. Ther.*, 1913, 16, p. 367.

12. Grateful acknowledgment is made to Dr. R. H. Wilson, who for several years has been associated with the senior author in this work, and who rendered valuable assistance in carrying out the horse serum virus experiments included in the present investigation.

ALABAMA VETERINARY MEDICAL ASSOCIATION.—The seventh annual meeting of this association will be held March 5, 6, 7, 1914, at Auburn, Ala., in the Veterinary College of the Alabama Polytechnic Institute. A meeting of the veterinarians of Louisiana, Mississippi, Georgia, Tennessee, North and South Carolina, Florida and Alabama is also called at this time and place to consider methods of preparation for the next meeting of the American Veterinary Medical Association at New Orleans the last week in December, 1914.

SOME OBSERVATIONS AND EXPERIENCES WITH HEMORRHAGIC SEPTICAEMIA IN CATTLE.*

BY R. R. CLARK, VETERINARIAN TO HAMPTON INSTITUTE, HAMPTON, VA.

Hemorrhagic septicaemia has not received the attention which its prevalence and high mortality entitles it to.

In March, 1906, I was called to see some cattle with this history: One yearling heifer found dead in the field; another died in the lane going to the stables; an old cow looked over her shoulder and dropped dead; one down in the barn, two yearling heifers in a box stall, crazy. Poisoning was suspected.

On my arrival at the farm I found the cow that was down with a sub-normal temperature and scarcely any pulse; vaginal mucous membranes bleached. One of the heifers in the box stall was caught and held for examination. She had a temperature of 105; pulse weak, about 90; respiration very irregular and fast. With a little excitement this heifer would fall to her knees very similar to a case of hydrophobia, except that she paid no attention to chickens. The other heifer was unable to rise, but was very nervous. Blood in the faeces was found in this stall.

I went to the cow that was down and as she was then in a comatose condition the owner agreed to kill her as I was not sure of my diagnosis. The post mortem lesions revealed a typical case of hemorrhagic septicaemia, but as I was a stranger in this neighborhood and the owner a man of very fixed ideas who had already diagnosed the trouble as "cerebro-spinal meningitis," I made a diagnosis of suspected hemorrhagic septicaemia, arriving at my conclusion by the process of elimination. To confirm my diagnosis and to make sure of my position with the owner who, by the way, is probably one of the most influential men in the

* Read before the Virginia State Veterinary Medical Association, at Richmond, January, 1914.

country, I telephoned to Dr. Faville at Norfolk, who was then in the employ of the Bureau of Animal Industry.

The next day he came over, went out to the farm and found another aged cow just gasping. Before posting her we visited the stall where the two heifers were confined. They were extremely nervous and showed similar symptoms to those described when I first saw them, except one of them was dribbling urine.

Dr. Faville was inclined to believe the trouble was hydrophobia as hydrophobia was very prevalent that fall. After post morteming a cow his diagnosis was the same as mine; but as the owner had published in the daily papers that his cows were "dying of cerebro-spinal meningitis we carefully packed some specimens from this cow and sent them to the Pathological Division of the Bureau of Animal Industry at Washington. In about thirty days I received a letter from Dr. Melvin stating that the *bact. bovisepiticum* was found and the diagnosis had been confirmed by a guinea pig test. Then and then only was the owner convinced that we were right.

There had been no new cattle on this farm for about thirteen months and the only reasons that I can assign for the cattle in the pasture contracting the disease, while the milk cows kept at the house did not contract it, was this:

The ditches passing through the fields furnished the water supply for the cattle in the pasture. The ditch banks were covered and the ditches themselves contained the carcasses of chickens and turkeys which had died, as the foreman said, of cholera. Buzzards were feasting early and late.

The well animals were well purged out and given ounce doses of hyposulphite soda in their feed night and morning. The two heifers that were so nervous in the box stalls made a slow recovery. Fifty per cent. of the cattle on this farm died inside of a week. I heard of farms in the same county losing cattle with history very similar to this outbreak, but did not see the cattle.

In 1908 I was called to a large dairy farm to investigate the death of "springers" which was occurring in a certain pasture. This is very low land, about seven feet above sea level, but con-

tained rather a large pond of fresh water that had no outlet. This was a *very dry season* and the water had receded from its banks and was full of flora.

The calves and yearlings in this pasture were never sick, but the cows which were turned in here when dry were those affected. In this outbreak there was a loss of four cows in five days, which was all the cows in the pasture. I diagnosed it as hemorrhagic septicaemia and the diagnosis was confirmed. Ninety per cent. of the cows at this dairy farm are what we call foreign cows, *i.e.*, they were shipped in from New York, Buffalo or Baltimore.

In the season of 1912, being short of pasture and thinking there would be no danger, the owner turned into this field twenty-four or twenty-five fine large grade Shorthorn springers. They were fat, sleek and a beautiful sight to look at. The first cow they noticed sick aborted and apparently made a recovery. The herdsman put her into the large barn with eighty-five other cows. They had a loss in this field of about eighteen or nineteen head and they thought it was due to various causes, but chiefly to "milk fever," as the cows would apparently calve a week or ten days ahead of time, get wobbly and go down. Once in a while one would linger along for three or four days.

This farm adjoins one of the Hampton Institute farms. As a matter of protection, permission was asked and authority given me to make an investigation of the trouble. I was taken into the field where a cow had been dead about twenty-four hours—a big, red Shorthorn weighing about 1,400 pounds. They were sure this cow died of milk fever, because "they had inflated her udder and then had found air beneath the skin around the left shoulder and thought they had put too much pressure on the pump, ruptured the bag and the gas had made its way beneath the skin."

This emphysematous condition is found frequently in cattle with hemorrhagic septicaemia. The owner was standing by while I made the post mortem, as I exposed the viscera and allowed the serum in the peritoneal cavity to escape, made the remark, "She looks like those that died four years ago." However, he was not willing to accept my diagnosis.

Previous to my visiting the herd he had written to the Bureau of Animal Industry for assistance. The next day Dr. Christopher, of the Bureau of Animal Industry, who was then stationed at Norfolk, came over. We found a cow that had come down the night before. She showed the following symptoms: Visible mucous membranes bleached, udder and teats a saffron color, listless, sub-normal temperature, pulse 20 to 24, respiration of 8 to 10. Only one heart sound could be detected; the formation of an ante-mortem clot was predicted.

Dr. Christopher reserved his diagnosis to the owner until his immediate chief, Dr. Owen, could be called in. This was on Saturday. On Monday Drs. Owen and Christopher came over; Dr. Kelsey, of Newport News, was also called in. We proceeded to the farm and were given permission by the owner to post the cow which Dr. Christopher and I had examined on Saturday. She was scarcely able to walk and you could scarcely detect the heart beat. Temperature was 94.

Dr. Christopher and I made the post mortem under the direction of Dr. Owen. Specimens were taken, packed and sent to the Pathological Division of the Bureau of Animal Industry at Washington. No diagnosis was made by Dr. Owen.

The owner being very skeptical of my diagnosis asked me to pick out a suspected case of the remaining few cows in the field. The conditions were almost exactly as the outbreak in the field four years previous. From the bleached appearance of her eyes and the color of her teats and udder, I picked out a large roan Shorthorn cow which to him was the picture of health, and they knew then that I was wrong. Nevertheless, in four days the cow was dead.

In about a week the owner received a letter from Dr. Melvin confirming my diagnosis of hemorrhagic septicaemia. Then the herd was turned over to me.

About this time a cow was taken out of the large barn and died in about two days. When I went through the large barn I noticed a cow being sick, and it was then, I learned, that the first cow that was sick had apparently made a recovery and been

put back in the barn. I immediately had her taken out and called the herdsman's attention to her teats and udder. As we passed down the barn a little further, I noticed another cow with bleached eye membranes. We passed through the stanchions to get back of her and found her teats and udder saffron color. I called the milker and found that this cow gave no milk that morning. On examination of her vagina found the membranes bleached. The cow died in forty-eight hours. This cow ate her feed the night before and the milker declared she gave her usual amount of milk.

This herd of cows was turned out daily in a large lot where they were allowed to pick over the corn stalks and stalks of soy bean hay which had been fed them in the barn earlier in the morning. In all my post mortems I have found the characteristic bladder lesions, *i.e.*, hemorrhagic areas over the internal membrane, the bladder distended with red or bloody urine. My reason for the cows in this barn coming down with hemorrhagic septicaemia is this: The first sick cow which apparently made a recovery was turned out with the cows in the barn, and it stands to reason that some of the food eaten by these cows had been contaminated with the urine from this supposedly well cow. We lost three head out of this barn, besides the cow that made the apparent recovery.

I immediately gave the eighty-two remaining cows in the barn an ounce capsule containing 50 per cent. solution of formalin. The next day they were fed night and morning in proportion to the weight, taking a 1,000 pound cow as the basis, an ounce of hyposulphite of soda. The second day each cow received an ounce capsule full of coal tar product. The cows were kept in the stable, only one case developed after treatment started.

Of the cows in the field that aborted and were infected four made a partial recovery and were kept for a month or two. They were emaciated, did not respond to treatment at all, so were destroyed.

The last cow that I took out of a stable you could pick out at

least half the length of the barn when you saw her udder and teats. I immediately had her taken to a quarantine shed and gave her an intravenous injection of sixteen ounces of normal salt solution. Repeated this the next day. In the interval she received strong heart and nerve stimulants. My object in giving the intravenous injection was, if possible, to destroy the ante-mortem clot, as I have never post mortemed a case of hemorrhagic septicaemia in which I did not find an ante-mortem clot in heart and blood vessels. This cow died on 4th day.

So far, my experience with hemorrhagic septicaemia, with the exception of the one heifer mentioned, has been contrary to the teachings of our text books, as I have never found but one animal in forty cases where there was not a sub-normal temperature and the membranes were not bleached. Instead of the animals being excitable, they have been very drowsy and in a more or less comatose condition within a few hours after the trouble was noticed.

In July, 1913, I received a call from a German settlement in an adjoining county to come at once as they had two sick cows. As this call came on Sunday, and from a German Mennonite, I knew it must be urgent, so I drove out the fifteen miles to see the cows. One was down gasping. She had aborted about four o'clock Saturday afternoon. The other was on her feet and had aborted some time the preceding Friday night, so as nearly as I could gather one case was about twenty-four hours old and the other about thirty-six. The cow on her feet showed symptoms which are to my mind characteristic of hemorrhagic septicaemia, *i.e.*, udder and teats saffron, visible mucous membranes bleached, temperature sub-normal, pulse slow, respiration slow and difficult, with a generally dejected, drawn, gaunt appearance. Before I could turn around the cow that was down straightened out dead.

As is usually the case, a number of neighbors were present. While they were dragging this cow out getting ready for my post mortem, I learned the following: About three miles from this farm another German had lost twelve cows in the past two weeks. He said, "The tick man tells me it is Texas fever." To the east

of this farm about three or four miles, there had been a heavy loss of cattle. Bloody murrain was the cause, so they said. On this particular farm there had been no deaths to my knowledge, since 1906 when they lost with Texas fever all of the Ohioan raised cows which they possessed. On the farm where the twelve cows died there had been no deaths, to my knowledge, for five years, and as the dead cows were native raised cows reared with ticks, the theory of Texas fever was very much exaggerated.

I made a careful post mortem of the cow. When I was through one of the old Germans said. "She looks just like the other cows that have died in this neighborhood." They had all noticed in particular the peculiar color of the udder and teats, but could not furnish any reason why it only seemed to attack those cows in advanced pregnancy.

In June, while on a visit to the Pathological Division of the Bureau of Animal Industry at Washington I had asked for their co-operation and made arrangements for them to furnish me serum in my next outbreak of hemorrhagic septicaemia. On my return home from this outbreak, I immediately telegraphed for serum. It arrived on Monday.

I went to the farm and injected all of the remaining animals. The one that was sick on Sunday was alive, apparently about the same. I gave her double the dose recommended by the Bureau of Animal Industry. The membranes of two other cows in advanced pregnancy were commencing to bleach. Nevertheless, I gave them the serum. In eight days I went up to give serum No. 2. I fully expected to find at least one dead cow, but the first thing the farmer said to me was, "She is eating, Doctor, and has come back to her milk. She is gaining in flesh and is milking fairly good, but one of the others has aborted." That was surely good news to me as I had known of this same man having every horse and mule on his farm die with the "so-called" cerebro-spinal meningitis. Two years from that time I saw it strike him again, causing heavy loss. In the same year he lost six fine Ohio reared cows from Texas fever. I gave serum

No. 2 and to date he has not lost another animal. The first cow that was sick which received a double dose of the serum is milking, so far as they can tell, as well as she did last year.

In September, 1913, the manager at one of our farms telephoned me that he had a sick cow. I went out and started in at the east end of our barn. This cow was standing about the fifteenth stanchion from the door. She was back far enough so that when I glanced down the line I could see her udder and teats. She was a small red cow with flesh colored udder and teats, when normal. What I saw was the peculiar saffron colored udder and teats, and I began to say things not taught me in Sunday School! Just then the herdsman came up and wanted to know what I was so "het" up about. He wanted to know "how I knew it was that particular cow," as he had not told me. I told him to examine her mouth, eyes and vagina and that he would find the membranes bleached. He thought I was a little far-fetched and laughed as he started to do as I had instructed, but when he found them as I told him he would he was greatly amazed. An examination of our milk sheet showed this cow had given her average amount of milk the night previous, but that morning only about half, and it was this which called the milker's attention, who in turn notified the herdsman.

With us, the "first loss is the least," so I took the cow out, destroyed her and held a post mortem. She showed very few of the characteristic lesions, except the urine. The urine was bloody. I carefully selected some of the specimens, packed them, drove home and caught a boat for Washington. Outside of the janitor I was the first person in the Pathological Laboratory that morning. As soon as the force arrived they went to work. The *bacillus bovissepticus* was discovered and a diagnosis made of "hemorrhagic septicaemia."

Not waiting for a confirmation of a diagnosis on the guinea pigs, Dr. Eichhorn gave me all of the serum he had. About ten o'clock that night I had given serum No. 1 to 127 animals. The next morning I treated forty head at our other farm. The next day, going to the outside farm where the first case developed, I

found four of our best cows with bleached membranes. The herdsman had discovered three of them himself before I arrived. I thought surely we were in for a great loss. I kept the cows in the stable but did not give any internal treatment. On the third day some of the cows were very stiff from not being accustomed to standing on the floor so long, as our cows are in the stable only long enough to receive their food and be milked, and as the udders of the four cows had commenced to clear up and they were eating good we turned them out. I did not go near the farm again until the eighth day, when I returned to give serum No. 2. The four cows were, so far as I could ascertain, perfectly normal. The herdsman said that he thought "one other cow had been off for a day or two as her milk record showed she was decreasing a little," but outside of that, I could notice no difference in any of the cows.

Without the serum I firmly believe that we would have had a heavy loss in this barn as there are about ninety cows running in one yard and a great deal of the roughage is fed out in racks, some of it is pulled out and some eaten from the ground, consequently it would have been easy for the roughage to be contaminated from the infected cows' urine.

I desire to take this opportunity to congratulate the Pathological Division of the Bureau of Animal Industry for its great achievement in manufacturing the serum; to thank them for the serum furnished, and for their aid in diagnosing this very fatal disease.

VETERINARIANS OF NEW YORK STATE, ATTENTION: During the meeting of the New York State Breeders' Association, at Rochester, February 4 and 5, a resolution was adopted, the object of which is to have a bill presented to the present legislature to improve and regulate stallion service throughout the state. Read the resolution on page 787 of this number and get in touch with your representatives at Albany and do not let up on them until there is a proper stallion service law on the statute of the Empire State!

SOME THOUGHTS ON VETERINARY EDUCATION.*

By T. B. ROGERS, D.V.S., VETERINARY DEPARTMENT, H. K. MULFORD COMPANY,
PHILADELPHIA, PA.

Education is life long. It commences when the child first learns that warmth and sustenance may be found at the mother's breast, it ceases only when he sinks into the lap of the mother nature in old age.

All men, all animals have a tincture of it and their comfort and success in life is entirely dependent upon the education they acquire and the use they make of it.

To cut short this preamble we may say that a good education consists in the acquirement of such knowledge as best adapts the individual to his environment. It follows therefore that the value of acquired knowledge is relative—for example, the ability to skate or travel long distances on snow shoes, while essential to the dweller in the north would be useless to one abiding under the equator. Equestrian training would be wasted unless animals of burden were at hand to be ridden. Proficiency in instrumental music would yield no pleasure to one unable to hear. Now we have traveled far from the day when Sir Francis Bacon wrote to his kinsman that he "had taken all knowledge to be his province." Huxley in one of his addresses on Medical Education realizes this and remarks that "if a man could live to be as old as Methuselah and could spend about four hundred years in the pursuit of a medical education he might be considered when his period of study had been completed to be a fairly qualified young general practitioner."

If we read the announcement of one of our higher class veterinary schools and contrast the scope and variety of instruction offered with the much more meager curriculum at the disposal of students of an older day, we are driven to the admission that

*Presented to the Veterinary Medical Association of New York City at its February meeting.

progress along the lines of veterinary teaching has been great indeed during the last quarter of a century.

Unfortunately, those among us who have had experience as members of State Boards of Examination or who have had to play the part of guide, philosopher, and friend to some of the present day alumni have often been compelled to stop and ask ourselves what is the reason for the lack of clean cut information so often shown by some of them. Why this pennysworth of the bread of knowledge to the large amount of sack of offered instruction? Is the pupil at fault, the teacher at fault, or shall we be compelled to look back of the period of technical instruction and find that the trouble lies with imperfect or ill-directed teaching in the public schools?

Commencing at the bottom let us examine educational conditions in the past and as now obtaining during the early years of school life.

In the past, as soon as the child reached an age at which profitable instruction was deemed possible, he was sent to school, **compelled to stay** there and subjected to a discipline somewhat harsh in character. If he applied himself assiduously he escaped with a minimum of corporal punishment, if he did not he was whipped until he underwent a change of heart. If the school was a good school its traditions involved deference to older pupils and fagging, the junior was a servant of servants, he was taught to fetch and carry, to act on the last sound of the word, and to keep silent. *He was disciplined* alike by teachers and older pupils. In due time he meted out the same treatment to *his* juniors. Now it is evident, while the treatment was harsh, that it tended to the effacement of self and that it resulted in the acquirement of a good deal of knowledge of sorts. At sixteen our school boy had done a good deal of Virgil and Caesar, had wrestled with algebra through quadratic equations, had struggled through enough Euclid to enable him to use his own mind to work out his own problems, had learned to write a decent letter and to spell correctly. Of physical science he was absolutely ignorant, his history was a collection of dates, he knew no foreign

language, his acquaintance with English literature was confined to gleanings from his casual reading out of school. Enforced study of the Bible and Prayer Book had taught him somewhat of the charm of the English language at high water mark, and it was with this preliminary training that he was sent as an articled pupil to a veterinarian.

Let us examine the advantages and disadvantages of this period of pre-collegiate instruction. The advantages are, the pupil learns to handle animals, becomes familiar with methods of restraint, personal observation on the cadaver familiarizes him with many gross pathological conditions, he learns how to make an examination for soundness, how to make a post mortem examination, how to remove a shoe. He becomes more or less expert in applying bandages or dressings to the various parts of the body. His work in pharmacy furnishes information as to the appearances of the more common powdered or crude drugs and their preparations, he is taught to dispense. Assisting his preceptor in obstetric cases he acquired a knowledge of dystokia and the many complications and accidents incidental to parturition. Practice in auscultation and percussion is afforded him and before he enters a veterinary school he has had a training in the *art* of medicine that is of inestimable value, and that must otherwise have been obtained at the expense of his clients and of his own reputation.

What are the disadvantages? I have heard teachers of veterinary medicine argue that such pre-educated pupils were cocky, that it was necessary that they *unlearn* much before they could profitably sit at the feet of Gamaliel, that pupilage tended to make practical men having contempt for the science of medicine, indeed that it tended to make quacks.

I do not think there is much to be said for this view.

During the first few years of a man's professional career his clients judge his proficiency in the *science* of medicine by his proficiency in the *art* of medicine, and many enthusiastic young men have been driven from their field of labor and indeed from their profession through their lack of practical knowledge.

Having passed his period of pupilage and entered a veterinary school the embryo veterinarian finds himself at an advantage, he recognizes a good many clinical conditions, knows a little of the methods of making an exhaustive diagnosis of lameness and is (compared with the pupil coming direct from school life) a pretty handy man.

He is able to make a good impression on the client and has learned "how to doctor the owner."

When he goes out with his sheepskin he can fire neatly, cast horses handily, castrate and spay, dress teeth, give boluses (a somewhat rare accomplishment with the unapprenticed youngster), pass male or female catheter, and to cut things short, has acquired enough practical knowledge to enable him to get business and hold it.

He is not a scientific man, perhaps he never will be, but his education has been of such character as will allow him to build well on the substantial foundation he has already obtained should he determine to do so.

Our modern education begins in the kindergarten, the child is tricked into work, which wears the guise of play, care is taken that he is not subjected to mental fatigue. In the primary school he comes under methods bearing little resemblance to the case hardening discipline to which his grandfather was subjected. The school is mixed, boys and girls, and the teacher is a woman who sometimes feels that life would be a blank if she could not teach, more often she is a normal school graduate who is fulfilling the obligation laid upon her at graduation, *i. e.*, that she teach for a pre-determined number of years as part payment for her normal school instruction. The bulk of these school women regard their occupation as a stepping stone to matrimony and under these conditions we cannot expect their efforts at teaching to be as richly rewarded by their pupils' progress, as it would be if they attacked it as a life work, grimly determined to succeed. If their pupils can get a passing mark—be shoved along to the next grade—well and good, and this grading on a passing mark goes on until the boy at about 18 receives his high school diploma.

He knows a little of everything on the earth and under it, his German will not usually allow him to converse with a German, he can be depended upon to misspell a few words in a two-page letter, the said letter being badly constructed; having crammed for examinations and passed them he has found it convenient to forget as far as possible their subject matter, and concentrate his mind temporarily on something else, his mathematics have not developed his mind to the extent that he can apply the principles of the science to problems arising in every-day life. We cannot blame him, attention has been principally confined to getting him through on time, reminding us of the story of the western stage driver: "As he drew up to the change station one of his horses dropped dead, and on a bystander remarking that the animal died suddenly, the driver said, 'Suddenly nothing; he died at the top of the hill a mile and a half away but I wouldn't let him down until he finished the trip.'"

In the modern veterinary school we find the same process repeated; the course consists of a hasty preparation for mid-year and end of term examinations. Here is about what happens:

"For Sale—A histology, biology and inorganic chemistry, in good condition, owner having passed his examinations on the above subjects *has no further use for the books.*"

Every energy is concentrated on passing marks. Occasionally a teacher who demands that the examinee be letter perfect, gives a little variety to the program by appropriating a disproportionate amount of the student's time.

Now this kind of system results in the inferior minds making the best records. The creative brain is at a discount, the man who wants to know why, gets lost in the scuffle, while the youth with a mind like a phonographic disk, a mind that can pour out just what is poured into it—this and nothing more—walks off with the honors at Commencement, and rarely does anything afterwards. I am assured that any state examiner of experience will bear me out in the statement that present methods result in the acquisition of a most interesting melange of misinformation and in all too many cases the system brings about a distaste for study in after years.

Does it give a veterinary education? It does not. It cannot, and unless enough time is added to the curriculum to allow a more leisurely absorption of knowledge, I do not see that the education of to-day will give any better results than the education of forty years ago.

Fundamentally I do not think the new one is as good as the old; the old system recognized its own limitations, realized that the best it could do was to place the student in a position where he could educate himself.

It seems questionable whether the amount of time given to bacteriology and sanitary science in the modern American veterinary school is justifiable. The subjects are of great importance, are necessary to the well-rounded practitioner, furnish an entree to governmental, state and laboratory positions, all things desirable in themselves, but to dwarf anatomy, shoeing, thereapeutics, obstetrics, in order that sanitary science may wax great, is to defeat the purpose of the veterinary school.

The function of the veterinary school is to make veterinarians, and unless we change their name and purpose, we have a right to expect that if we send our boys to them to acquire the rudiments of veterinary practice they will be equal to their responsibilities.

I do not wish to be misunderstood, the modern veterinarian must be thoroughly grounded in bacteriology, bacteriotherapy, helminthology and hygiene; but should we not, like our English brothers, furnish opportunities outside of the course for the degree, for a thorough training in these branches?

So far this paper is destructive—it is a kick. What can we do to improve things?

In my opinion the English system of "articled pupils" is a good institution, if for no other reason than to act as a filter for the removal of young men who are not suited for the environment furnished by the practice of veterinary medicine. Many of these unfortunates, believing that the profession opens the way to a life of ease and much readily gained remuneration, enter it and leave it in a few years, realizing that their idol has feet of clay.

It is not easy work, it is not easy money, and no man should enter upon it unless he loves the work. Secondly, we must ask the schools to devote more attention to sound instruction in the practical branches.

A man might be a better bacteriologist than Pasteur and starve to death in a country practice through his utter inability to perform every-day surgical operations in a satisfactory manner. A system of education that allows a graduate from a three-years' school to state that a salient symptom of cystitis is pain in the region of the cyst, or that allows a physician to qualify as an expert and then make the statement that the blood is returned from the heart by the descending colon, leaves, perhaps, something to be desired. Again, the lack of clinical facilities in some of the state schools should if possible be remedied. Often these institutions are located in small towns that of course offer a minimum of clinical material. In the future, too, we may be in a position to consider a more rational method of filling the chairs in the schools; are we not at present too prone to regard availability from the financial standpoint, the question of the appointee being an alumnus of the particular institution, etc., rather than his experience and qualifications as an instructor?

I have touched upon the danger of too much sanitary medicine, and return to it here only to suggest that steps be taken to provide post-graduate instruction with a certificate of study, for veterinarians desiring to devote themselves to laboratory or research work.

I have considerable correspondence with English veterinarians and must admit their letters evidence that both their school and collegiate education, as demonstrated in their correspondence, give better results than ours.

I think it is worth while to inquire why? We cannot in the time at our disposal give a veterinary education, the best that we can do is to place our students in such a position as will enable them to build on the foundation we have provided, and in my opinion the sooner all of us realize this the better it will be for the veterinary medicine of the future.

THE SIGNIFICANCE OF PUS AND STREPTOCOCCI IN MILK.*

BY F. H. SLACK, M.D., BOSTON BOARD OF HEALTH, BOSTON, MASS.

The story is told of a certain physician who was intensely interested in diagnosis; that he was summoned one night to the bedside of a patient who was seriously ill; as a result of his physical examination the learned M.D., in the presence of the anxious relatives, went into ecstasies over what he called a "perfect" case of the disease in question; with increasing animation he dilated on the presence and significance of each diagnostic symptom and finally, in his abstraction over this perfect disease picture, left the house without prescribing for the patient or the giving of any directions for his ease or recovery.

Now we all laugh at this poor, absent-minded fellow, but after all his is a common fault. As a general thing it is easier to locate the trouble than to bring forward the cure. Correct diagnosis is almost indispensable, but not of much benefit without the remedy.

Public health officials have long and justly been concerned about the condition of the milk supplies, to which have so often been traced the responsibility for outbreaks of disease. It has been their aim to locate the causes of such misfortunes and to remove them; in other words, to diagnose and cure the case if possible.

Of course errors have been made in both directions. Some of our medicines have been too drastic; some symptoms once regarded as diagnostic we now ignore. Laboratory workers who never milked a cow have collided with dairy men who never saw a microscope. The theoretical and the practical have met on

* Read before the Massachusetts Veterinary Association, Boston, September, 1913.

the arena and much milk has been spilled, and now with honor satisfied they find to their astonishment that their interests are the same and that the solution of the milk question rests in their cordial co-operation.

There has been a gradual increase in real knowledge on both sides; a gradual acquirement of common sense from repeated examinations and inspections. Fair dealing is still demanded for the consumer, but the rights of the producer are also recognized and we now realize that mutual understanding and co-ordination of effort is far better for all concerned than misunderstanding, antagonism and recrimination.

With no milk test has there been such wide variation of opinion, both as to methods of making the test and significance of the findings, as with the test for leucocytes or "pus."

Since Stokes of Baltimore in 1897 published the results of his first tests, together with his estimate that the presence in the milk of an individual cow of five cells per field of the oil immersion lens was justification for excluding the animal from the herd an immense amount of work has been done by careful investigators. Dr. Stokes would probably be the first to condemn so rigid an exclusion test to-day; he deserves great credit as a pioneer in this important branch of milk inspection and his early conclusion is mentioned simply as an indication of the knowledge or lack of knowledge of this subject sixteen years ago.

I cannot do better than quote Stone and Sprague's admirable summary of work from 1897 to 1909:

" Various methods of enumerating leucocytes have been used by students of the subject, each establishing an arbitrary standard based upon a method of counting; Stokes and Wegforth were the first to establish a standard based upon the following method of enumeration: A definite quantity of milk was centrifugalized, the sediment spread over a definite area, stained and examined with a one-twelfth inch lens. They considered that five cells to the field of the microscope indicated pus. Bergey regarded ten cells per field as the limit; Stewart adopted twenty-three cells per field as a standard; Slack considered fifty cells

per field the maximum. The above investigators used different modifications of Stokes' method. Doane and Buckley employed the following method: Ten cubic centimeters of milk were centrifugalized, the cream removed, the milk drawn off nearly down to the sediment, two drops of methylene blue added and then water to make up to one cubic centimeter. This was thoroughly mixed and a Thoma Zeiss blood counter used for enumerating the cells. They considered 500,000 leucocytes per cubic centimeter as an indication of pus and expressed doubt as to whether this was high enough."

Russell and Hoffman found that cows without the slightest indication or history of udder trouble frequently had leucocyte counts as high as one million or even higher.

These and other investigators have shown that there is a wide variation in the leucocyte content of milk even when taken from the same cow day by day.

In an effort to throw more light on this question Stone and Sprague made daily tests of the milk of two healthy Jersey cows during the entire period of lactation. They say: "During all this time both of these animals were kept under exactly similar conditions, on regular feed, with the exception of a change (on May 23) from dry feed to grass. They were carefully watched and subject to frequent veterinary inspection and during the entire period were pronounced to be in perfect health.

"One and one-fifth per cent. of the entire 1,167 samples showed leucocytes 10,000 per cubic centimeter.

"7 per cent. between 10,000 and 20,000 leucocytes per c. c.

61 per cent. between 20,000 and 100,000 leucocytes per c. c.

29 per cent. between 100,000 and 500,000 leucocytes per c. c. and only 1 per cent. above 500,000."

They say: "The most surprising fact noticeable in our work is the remarkable sudden fluctuations which occurred occasionally with no apparent cause. Thus July 15 Tansy (one of the cows) showed a count of 10,000 and 75,000, rising on the 15th to 535,000 and 1,440,000, dropping again in two days to 90,000.

"Doris (the other cow) on the same day showed no increase.

Again on the evening of July 27 Doris' milk contained 75,000 leucocytes, suddenly increasing to 134,000 and 950,000 in the next two milkings, dropping again to 90,000 on the second day after. During this time the other cow showed no increase, registering 60,000 on the day of Doris' maximum."

Prescott and Breed worked out a new method for counting leucocytes and drew the conclusion that much larger numbers of cells are normally present in milk than has been supposed. Concerning their findings they say: "The average number of cells present in the samples examined is approximately 1,500,000 to the cubic centimeter, while numbers less than 100,000 per cubic centimeter are uncommon."

The A. P. H. A. Committee on Standards of Bacterial Milk analysis recommend that a leucocytic count of 500,000 or more to the cubic centimeter in mixed milk be taken as sufficient evidence to warrant exclusion of the milk from the market until satisfactory veterinary inspection of the herd has been made, using either the Doane Buckley or the smeared sediment method.

Attention should be called to the significance of a grouping of the leucocytes. When garget is present we expect not only to find great numbers, but to find them massed, while in a normal condition the cells, even if greatly increased, lie separately.

An intelligent use of the low-power lens in addition to the examination with the twelfth oil immersion is of great assistance in sizing up a suspicious sample. In the Boston Laboratory we recognize four grades, which we report as normal leucocytes, increased leucocytes, greatly increased and pus.

The cause of pus, *i. e.*, over 500,000 leucocytes to the cubic centimeter, cannot always be demonstrated as a physiological condition, which seems demonstrated as a possibility, it may be possibly due to some change of food or environment; I have often noticed an increase of such milks in the spring when presumably the animals are turned out to pasture. An increase of leucocytes is also common when the cows are "drying up."

My first case of "garget" was a staphylococcic infection. I have also found "pus" due to the presence of the tubercle

bacillus. It is probable, however, that the most common causative factor is a long-chain streptococcus.

Skilled observers are unanimous in agreeing that the presence of long-chain streptococci twined among massed leucocytes is evidence of a diseased condition of the cow's udder. The A. P. H. A. Committee report says: "Long-chained streptococci are sometimes found in the smeared sediment, especially in pus milks. The presence in such smears or when found by the plate method in numbers of over 100,000 to the cubic centimeter should be considered sufficient evidence for exclusion of the milk until after satisfactory veterinary examination of the cows."

It is not necessary for this condition to be found in all parts of the smears, especially in the examination of a mixed milk, a few typical masses of leucocytes with streptococci are evidence that milk from a diseased animal is present in the mixed sample. Individual samples from the herd will then usually show one or more which give a typical picture. It is probably true that milk of this type is a serious menace to public health and the causative factor in some outbreaks of tonsillitis. Of course we recognize that good milk from healthy animals may become infected from a human case of tonsillitis and an outbreak result due to human carelessness rather than to disease of the animal. In studying such epidemics both the human and bovine sources should be considered.

I have no excuse to offer for the dairyman who, to make a few cents, imperils the welfare of the public by including milk from a known diseased animal in his supply. The symptoms of garget or other udder disease are often manifest, and dairy-men of to-day know that the use of such milk is fraught with danger. It is my sincere belief that one proven guilty of knowingly including such milk in the public supply should receive all possible penalties.

While it must be acknowledged such persons occasionally are found, we are thankful to believe they are exceptional, and that the average dairyman would refuse to stoop to an action so despicable.

Chronic disease conditions may exist in the udder and no external evidence be available. Milk from such an animal would unwittingly be mixed with the market supply, unless detected by bacteriological examination. Such a case is one for co-operation rather than prosecution, and the dairyman is usually willing to dispose of such a cow, meanwhile withholding her milk from the market.

During nine years of such co-operative work between the Boston Health Department and producers of milk, infected milk, as shown by our tests, has decreased from 10.83 per cent. of all samples collected in 1905 to .8 per cent. in 1912.

The majority of these cases of infected milk have been investigated either by the Bureau of Milk Inspection or the Dairy Division, with results which indicate in nearly every case the value of the microscopic findings. I quote from Prof. Jordan's report for 1911:

Each year, whenever infected milk was found, an attempt has been made to ascertain the cause for the abnormality. This has involved an investigation when possible, at the farm where the milk was produced. Much of this information is procured through the dealer, from whom the original samples were obtained, but it has not been possible in all instances to secure the desired data.

These inquiries have, however, supported the contention that some producers are willing to sell milk from cows where the evidence of disease is apparent. Fortunately this condition does not hold good with the majority of farmers. This claim of non-attention to health of animals is further upheld by the results of the inquiries during 1911, by which the following information was gleaned:

1. Cow with inflamed udder.
2. Cow with injured udder, caused by being kicked by another cow.
3. Cow with a sore on udder.
4. Cow with a so-called spider or a hard bunch on one teat.

5. Cow affected with garget.
6. Two cows with bad teats, "hard milkers."

In conclusion I wish to emphasize the importance of all working together on these tests, so that milk excluded from one place will not be put on sale elsewhere; also the importance of efficient pasteurization to prevent outbreak of disease, for while inspection should continue and the clear production of milk be insisted upon, only by final pasteurization of the market milk can we hope to eliminate outbreaks of milk-borne contagion.

Dr. Ray J. Stancliff, veterinarian 8th Cavalry Camp, Stotsenburg, Pampanga Province, Philippine Islands, has been transferred to the 15th Cavalry, Fort Bliss, Texas.

A MILLION DOLLARS WORTH OF DOGS went onto the benches in the NEW GRAND CENTRAL PALACE, New York, when the Westminster Kennel Club Dog Show opened on Washington's Birthday. An extraordinarily large entry had been received, and the outlook for an exceptionally satisfactory week, both from a social, sportsman's and educational viewpoint, was promising.

A GOOD TROTTING SIRE REACHES THE EMPIRE STATE.—Guy Axworthy, 2.08¾, formerly at the head of Senator J. W. Bailey's stud, Lexington, Ky., has reached Poughkeepsie, N. Y., where his present owner, Mr. Leo Oettinger has Lady Worthy, 2.11¼; Belle Gibson, 2.21½; and several other trotting mares which he will breed to him. Guy Axworthy is the sire of some good ones, and has excellent conformation, and at his mature age should leave his mark in New York State.

NEW CHIEF VETERINARIAN TO THE NEW YORK CITY BOARD OF HEALTH.—It will please the many friends of Dr. E. B. Ackerman, of Brooklyn, who has been connected with the Department of Health in Brooklyn for nearly twenty years as chief veterinarian in that Borough much of the time, and as chief of the Sanitary Division for the past year, to learn that he has succeeded Dr. S. K. Johnson, who retired on the last day of the old year, as chief veterinarian of the department, with jurisdiction over all the Boroughs. We congratulate Dr. Ackerman, and especially congratulate the New York City Board of Health on having so earnest and capable a man as chief of its veterinary bureau.

JOHNE'S DISEASE.*

BY CHARLES E. MORRIS, D.V.M., CANASTOTA, N. Y.

Name.—Johne's disease or chronic pseudo tuberculous enteritis. This disease is named after the man who discovered its cause; namely, acid-fast bacillus in cattle. It is principally a foreign disease, but is far from being rare in this country.

Definition.—A chronic specific enteritis affecting cattle, more rarely sheep, deer and goats, caused by the multiplication in the intestinal mucous membrane and mesenteric glands, of a specific micro-organism known as Johne's bacillus, and which produces a diffuse thickening of the bowel and an interference with food absorption which leads to diarrhoea and wasting.

History and Distribution.—Old writers on veterinary subjects devoted most of their attention to horses and horsemanship, and of these old writers, however, some did mention that in cattle certain forms of diarrhoea were very chronic and incurable. A Frenchman who, in 1826, compiled a dictionary on the Veterinary Art, mentioned under the head of enteritis in cattle, a thickening of the mucous membrane of the large and small intestines, which was associated with a chronic diarrhoea. In 1831 Farrow and Cartwright both mention diarrhoea and wasting in cattle, and describe lesions which leave very little doubt but that the disease existed in England over eighty years ago. In 1881 Bang states that certain cattle were brought under his notice in which chronic diarrhoea was accompanied by a thickening of the intestines. In 1895 Johne, Professor of the Veterinary School at Dresden, and Frothingham, an American doctor working with him, first drew attention to the presence of an acid-fast bacillus in the thickened intestine. Harms, a veterinary surgeon of Oldenburg, applied the tuberculine test to a six-year-old cow suffering from diarrhoea, which he thought was tubercular in origin. The

*Read before the Central New York Veterinary Medical Association at Syracuse, November, 1913.

animal gave a slight reaction and was slaughtered. On post mortem the lungs and lymphatic glands were found to be normal. The caecum and small intestines were sent to Johne at Dresden. He found the ileum to be thickened in a manner which is now regarded as characteristic of Johne's disease; and on staining portions of the bowels he discovered the acid-fast micro-organism which were then believed to be the tubercular bacillus. The condition was therefore described as a hitherto unrecorded form of tubercular infection of the intestines and they conclude from their researches that the condition was a previously unrecognized form of tubercular enteritis due to an infection with the tubercle bacillus or a variation of one of the micro-organisms brought about by some change in nutrition. Such a change they thought might be responsible for the alteration in virulence and for the negative or very slight reaction produced by the inoculation of the ordinary diagnostic dose of tuberculine into the affected animal.

In 1904 Markus stated that in Holland the disease had been recognized for many years. Repeatedly attention had been drawn to the thickened intestines of emaciated cattle which showed no gross lesions in any other cattle. He also states that in some districts this condition in cattle was known as "Scheisser," and which is probably equivalent to the English term "Scowers." In 1905 Bang published an account of his inquiries into this disease in Denmark, and his authority must be credited with making the first real advance in our knowledge of this condition since the discovery of the acid-fast bacillus by Johne-Bang first established the fact that the disease was a specific infection, distinct from tuberculosis and he suggested the name "chronic pseudo tuberculosis enteritis." He showed the existence of the disease among red Danish cattle and other native breeds as well as in imported tubercular-free Jerseys. By feeding two calves with mucous membranes of the intestines of an affected animal, he was able to reproduce the disease. His attempts to cultivate the bacillus and produce lesions in guinea pigs and rabbits were negative and he decided that the condition

was not a true tuberculosis. He also demonstrated its chronic nature and the long period of incubation. The same year Bang gave an account of the disease before the National Veterinary Association at Liverpool and showed specimens for an illustration. He predicted that it would be recognized in this country and mentioned that he had found it in the tubercular-free Jersey cows imported from the 'channel islands. In 1907 McFadyean gave an account of six cases which occurred in Shorthorns, Sussex and Jersey cattle. Since this date very many cases have been recognized and it is now generally admitted that the disease is prevalent all over England. Chase has seen it in imported Jerseys in South Africa, Beebe, Pearson and Melvin have reported cases in North America. In Germany, Switzerland and India the disease has also been reported.

Cause, is acid-fast bacillus. In the later stages of the disease the bacilli are discharged in large numbers in the feces of the animal, and it is with these bacilli that the food supply and water become infested, and the disease conveyed to other animals. The bacillus may also attack sheep, deer and goats and possibly allied animals. It occurs in animals of both sexes and all ages, though from its chronicity it is never observed in the very young. Damp, marshy districts seem to predispose to infection, possibly by allowing the specific bacillus to retain its vitality for a longer period outside the animal body. The length of time the bacillus can live and remain infective outside the body has not been accurately determined, but it is probably quite considerable; although it is highly improbable that the bacillus can multiply in the soil, it is quite conceivable that the dung hauled in large quantities on to land that is used for growing roots, etc., that it is capable of infesting the roots so by this means the disease may be spread. Many authors are inclined to consider certain breeds of cattle more susceptible than others, also housed animals more than pastured.

Symptoms.--In the early stages there are no symptoms from which a positive diagnosis can be made. It usually starts in with the animal becoming unthrifty. In the course of time they have

slight attacks of diarrhoea, lose more flesh and give less milk. In cases of pregnancy the additional strain generally hastens the progress of the disease, sometimes diarrhoea is not shown until after calving. The course of the disease depends somewhat upon the diet and general hygiene, but ordinarily it lasts about six months, varying in well-kept animals, those in pregnancy, tuberculous, etc. The temperature is normal or subnormal. A rise is probably due to some co-existing disturbance. There is no cough, the muzzle is moist, the eyes bright, although they may be sunken in, due to the absence of intraorbital fat.

In advanced cases the mucous membranes are pale and anemic. The pulse is sometimes weak and may be fast. As a rule the appetite is unimpaired and the animal ruminates to the end. In spite of the absence of fever there is generally great thirst. Oedematous swellings sometimes appear in the intermaxillary space and under the sternum. The color of the feces is unchanged, although undigested particles of food can be detected, and when the diarrhoea is very acute, blood-stained mucus may be seen in the ejecta. The diarrhoea is often intermittent in character and in some cases appears to recur at more or less regular intervals of about three or four weeks, between attacks the animal improves somewhat in condition; no marked abnormalities are found in the urine; also the milk remains unchanged except in quantity.

Diagnosis is made by finding the acid-fast bacillus with the aid of the microscope; also an autogenous vaccine is quite reliable only that it is hard to procure.

Differential Diagnosis.—The causes that may give rise to diarrhoea in cattle are varied and include errors in feeding, frosted roots, moldy material, various mineral poisons, intestinal parasites and tubercular enteritis. The irritants which arise from unsound food, poisonings, etc., may be considered together. There will probably be several animals attacked at once. The symptoms as a rule are acute and the diarrhoea is well marked before the animal has suffered sufficiently from the toxic effects to become emaciated. It may be accompanied by fever, loss

of appetite, cessation of rumination and an examination into the dietetic and the hygienic management of the farm will soon reveal the cause. The chief characteristics which distinguish this from the intestinal parasites are the high temperature a more rapid course, and on post mortem the finding of these parasites. Tubercular enteritis will react to the tuberculin test while Johne's will not.

Prognosis.—Recovery from this disease is very rare, although age, sex and care figure to quite an extent in prolonging life.

Treatment.—There is no specific treatment for Johne's disease, no drug is known that will kill the bacillus in the pathological lesions or neutralize the toxins which they produce. Moreover, the risks that one diseased animal will infect others on the farm is so great that by far the safest and cheapest course is to kill all infected animals. Curative vaccines are being experimented with at the present time. The prophylaxis is of much greater importance than the treatment. All material which is apt to carry infection should be burned. All other should be thoroughly disinfected with some strong disinfectant.

THE NORTH DAKOTA VETERINARY ASSOCIATION.—At the last meeting of this association the members were fortunate in having with them Prof. Septimus Sisson, of the Ohio State University, who presented a paper entitled *Anatomical Surgical Landmarks*, illustrating his subject with slides and also by demonstrations on the living animal. Prof. Sisson's ability as an anatomist bespeaks the great pleasure and benefit his discourse must have been to his listeners. After electing Dr. F. L. Cusack, of Carington, president, Dr. F. H. Farmer, of Wahpeton, vice-president, Dr. B. C. Taylor, of Hillsboro, treasurer, and A. F. Schalk, of Agricultural College, secretary, the meeting was adjourned to meet in the week of July 20, 1914, during *State Fair Week*. We are indebted to the retiring secretary, Dr. C. H. Babcock, of New Rockford, through whose courtesy we received the above data.

PHILADELPHIA HORSE OWNERS AWAKE TO FACTS; others awakening. See pages 792-94, present issue.

BREEDING OF THE PROPER TYPE OF HORSES SHOULD BE ENCOURAGED.

By J. F. DEVINE, VETERINARIAN, GOSHEN, N. Y.

There appeared in the December issue, No. 3, Volume 44. of the AMERICAN VETERINARY REVIEW, a timely article from the pen of Mr. T. Butterworth, Editor of *The Live Stock Journal*, Chicago, and in the same issue an editorial on *Veterinarians and the Allied Horse Interests*. In the February number of the same periodical we had the pleasure of reading a very practical article by Dr. M. A. Pierce, of Paterson, New Jersey.

This has prompted me to add a word of support to the opinions set forth in the articles mentioned.

Those of us who have been interested in veterinary matters for fifteen or twenty years, have seen great changes in veterinary education and in animal industry, and I think it can be said with due modesty that these changes have been for the betterment of mankind in every way. But I think we are reaching a point where possibly a criticism of our lack of natural interest in the question of practical horse and stock raising may be justified. It would seem that in our attempt to get away from the shortcomings of the old style "horsey" veterinarian we have jumped almost too far. I often stop and wonder if it is an impossible composite to be a practical horseman and stockman and to still be a learned and cultured veterinarian. The dogma, as laid down in the article by Mr. Butterworth, that the veterinary profession should be more interested and active in such matters, is good teaching. All veterinarians should affiliate themselves with organizations which have to do with the betterment and regulation of stock-raising in general.

While conditions differ in different localities there are certain fundamental principles which can be applied generally to most any horse-breeding community, some of which are:

Keeping in touch with what the market wants. The markets vary as to the requirements of weight, style and finish of a horse more than the average man can appreciate, unless he keeps in touch with the market.

Encouraging and creating what is termed community interest in horse breeding, which will have the effect of producing a centralized point where the advantages of varied experiences, successes and failures can be shared by many rather than by the individual struggling to make perfection, and where the burden of expense necessary for this work is likewise shared by many rather than one. This centralization also has the advantage of bringing buyers to a certain point and builds up shipping facilities.

Breeding the type of horses that are popular and salable at your nearest market.

In determining upon the class of horse to breed it might be well to keep in mind that at the present time the influx of autos of various styles has largely usurped the work of certain types of horses.

The market value of the draught horse was never higher than to-day. The motor truck will probably replace long hauls and freight service, but it is not replacing and probably never will replace the short hauls for town service.

There is still a demand for saddle horses, and it would seem that the popularity of this class is as great in our large cities as it has ever been.

The good trotter was never more sought for than he is to-day.

We must recognize the fact that road cars have largely displaced the ordinary road horse, but that the heavy harness horse is still popular and in vogue in a measure.

In breeding any type of horses remember that the trite saying of Robert Bakewell, "Like produces like, breed the best," is as true as ever.

Read occasionally the rules laid down in some of our text-books on the question of breeding. The following is a good illustration:

- "1. Breeding to a standard of excellence, ideal or real.
- "2. Breeding only from parents which conform to this standard in a marked degree.
- "3. Breeding from parents, more especially males, which have long been bred without intermixture of alien blood.
- "4. Mating animals so as to correct the defects of the parent in the offspring.
- "5. Practising a selection at once rigorous and persistent.
- "6. Giving due attention to environment, sanitary conditions, feeding and handling."

Statistics show that about 2 per cent. of all animals in the United States are pure bred, and that authentic pedigrees do not date back more than 75 years. When we compare this information with the advantages in type, individuality and quality that have been brought about in the pure bred as compared with the mongrel in such a short period, we do not have to argue long with a man of average intelligence as to the advantages of the purely bred animal. As a practical illustration of the value of breeding, we may refer to the thoroughbred which is the highest type of domestic animal ever bred by man, and it has been stated that no thoroughbred with a 1-32 of cold blood ever won the derby.

The opinion seems to prevail that on large farms and in the corn belts is the only place for the heavy draught horse. It might surprise some to know that in Belgium, the country that produces our heaviest draughters, the farms average about three acres in size, and that the large mare oftentimes performs the work of our ordinary team, as well as supplying the family milk. In France, the home of the Percheron, most of the breeding farms are not larger than ten acres. Compare this with New York State where there are 215,597 farms with an average acreage of about 100

acres; and with a ratio of about two and one-half horses of all ages, including colts, to a farm.

The advantages of breeding and individuality are so appreciated in Belgium that the government subsidizes their champion stallions, paying a premium of \$1,200 per year in addition to the regular service fee which the owner collects, so as to induce the keeping of these stallions in their own country and preventing the exportation of the best. A similarly plausible condition exists in Scotland, where a committee of farmers and breeders solicit the standing of a stallion in a community, guaranteeing a certain number of mares each year at a certain sum. In this way they get an option on a stallion of great quality and the stallion owner is assured a reasonable fee for his expensive holdings.

Think of the profit that would accrue annually to our New York State farmers, when we consider the fact that we purchased last year 80,000 horses at an average price of \$250 each, which approximates twenty million dollars. Assuming that it costs \$155 to raise a colt to the age of three years in New York State, as computed (\$110 being the federal estimate of all states for the same period), and further assuming that one-half the colts were sold at three and the other half at four years of age, this would mean a revenue of many million dollars to our farmers and breeders, without the expense of shipping and acclimating.

At the present time about one stallion in seven in New York State is pure bred, but with the present outlook for a stallion law to regulate and properly protect the pure-bred meritorious stallion, it should be but a short time when the greater number of our stallions which are allowed to stand for service will be pure bred and with the proper selection of mares and the excellent grass land and climate, New York should be one of the greatest horse-producing states in the union.

In conclusion, it is our opinion that veterinarians should look into the advantages of horse breeding in their respective states, and when conditions warrant it should assist in the selection of sires and mares and encourage the raising of marketable horses of the choicest type.

HOG CHOLERA SERUM IN PRACTICE.*

BY CHAS. L. COLTON, V.M.D., HARTFORD, CONN.

In preparing a paper two requisites present themselves. First, original research; second, careful compilation of the original work of others along the line one wishes to exemplify. For the former, few of us have time or facilities, while for the latter, I for one, lack the adaptability; therefore in complying with the request for a paper, I have fallen back on a report of work in hog cholera during the past six months as practised with hog cholera serum, thinking it may be helpful to some placed as I have been.

Early last December, over the 'phone came the usual message: "I've a sick pig! Won't eat anything; eyes and nose running! Constipated. How many have I? Oh, 17 weighing about 25 pounds. Better let you see them? May have hog cholera? Not a bit of it, besides if they had it they will die anyway. Don't like to pay good money to veterinarys for dead hogs. Just send me a physic and a tonic. I'll soon fix them myself."

On February 1st, this client called me to see one dead hog and the six remaining of the original 17 he had in December. Post mortem clearly revealed typical hog cholera lesions; but no argument could induce the owner to inject the few left, as no guarantee could be given of cure and the expense, for the weight, would have been high.

Careful inquiry has led me to the conclusion that to the ordinary owner, the pig is looked on as the producer of clear profit; it can be neglected to a certain beautiful, dirty degree; for a large part fed on feed otherwise thrown away, and finally show a profit from seemingly nothing, and we all like to get "something for nothing." Therefore medicine costing 50 cents to 6 dollars per dose is not very popular.

* Read before the Connecticut Veterinary Medical Association at Waterbury, August, 1913.

Always I have met the same old "dare." "If you wish you may inject the well ones. If they live I'll pay, but if they die you stand it all." At last, on this ground I injected five pigs of 85 pounds average weight with hog cholera serum at the ratio of 40 c.c. per 100 pounds. These pigs were from a lot of six bought at the average price of \$6.50. One had died, showing hog cholera plainly developed when I arrived. Three were running from the eyes and sniffling; the purple spots well marked and all were very dumpish. Temperatures from 102 to 105. One so near dead that it seemed like throwing the serum away to treat him. One with temperature of 101, but seeming well, making five in all.

The sick ones improved at once and the dead one was boss of the pen in two weeks, when he broke his leg, which put him out of the running for a big pig like his brothers now are, for even he is doing well. Two developed abscesses at the point of injection, subsequently causing death from neglect, as I was called away for three weeks and we were not informed of the condition until one morning the owner presented himself at my elbow with, "Well, I pay for three live pigs, you pay for two dead ones."

Blood poisoning was, I think, the cause of death in these two pigs, judging from his description. He was more than pleased and so was I, as it was a good demonstration of the value of the serum. Next year he intends to buy more and inject while the animals are young, about 15 pounds, thus we may get five pigs injected (on the basis of 40 c.c. to the 100 pounds, from a cost of \$2 for a 50 c.c. package of serum.

In another case, 21 pigs had been reduced to 7 while the owner was "a waitin' ter see sumpin'," finally by agreeing to do the work at cost he allowed me to inject the remaining seven; average weight was 32 pounds and the dosage on the basis of 30 c.c. Improvement was noticeable on the second day, none were lost, all growing up finely. Here also next year will a large investment be made, as this man is a hog raiser and now that he feels somewhat assured he will invest and inject at about 15

pounds weight. His father's hogs were all wiped out because "He guessed he'd see what Ed's did on the stuff," and while waiting slowly, one at a time, burned up the few he had left of his once fine pen.

The most satisfactory test was at the Jacob's Egg Factory, in West Hartford. Here again owing to the by-product refuse idea, although the stock was pedigreed, ten days elapsed from the first symptoms to the death of a 300-pound future prize winner when I was called in. This pen originally consisted of 14 pigs; 1 was dead showing hog cholera lesions; 5 average weight 15 pounds; 1, 152 pounds; 7, average weight 300 pounds—13 in all and every one sick with cholera. The purple spots were much more marked than in any previously treated. Injections were made on the basis of 40 c.c. per 100 pounds, excepting a 250-pound boar, very badly affected, bleeding from the nose and almost dead; remembering my other "almost dead" hog I injected him with 150 c.c., but although he rallied he, with two of the 15-pound pigs, died on the third day. These latter were paralyzed at time of injection. Thus out of 14, four were lost, one before and three after injection, ten being saved.

To sum up, in all 42 pigs were originally purchased by three widely separated farmers, with pens and surroundings we may designate as poor, good, fine; 17 died before treatment, 25 were injected and returned at once to their pens. 5 died after injection even counting in the so-called blood-poisoning cases and the dying boar, so that if the ratio had been maintained 7 instead of 17 would have been lost had the serum been used.

In doing this work one must be more than ordinarily careful about infection, as everything favors contamination, even to the serum itself before you can get it injected.

Judging from the above, we may safely assure a client that for a dose cost of .02 cents per pound plus our fee, which for this class of work must be as low as possible, that four out of every five pigs can be saved if injected shortly after the first symptoms are noticed.

Don't stint the dose, rather figure on 50 c.c. than 40 c.c. Always take the large amount when handling small pigs.

It is difficult to make the farmer understand how infection can take place, but as you all know flies, cats, dogs, rats, previous infection and using old infected pens. Keep everything, man and beast out of the pens. Boil the swill food, as the first outbreak mentioned was caused by a hired man throwing the remains of an uncooked ham into the pigpen of the 17 pigs; at least so I think, for I have been unable to discover any hog cholera within ten miles of that pen and the animals were on the place three months before the disease manifested itself and there had had not been any trouble of the kind on the place before.

Last, and well to remember, is the Sunday afternoon call of the other fellow's hired man, who, after musing around his sick hogs, goes over to see "If Jim's hogs is actin' like ourn." Into the pen he goes, and if it is not already there, it requires only the classical time to make "Jim's pigs like hisen."

THE BANQUET AND DANCE OF THE B. A. I. ASSOCIATION OF CHICAGO was held at Stock Yards Inn, Chicago, on Saturday evening, February 14, 1914. Among those invited to address the body were Dr. V. A. Moore, director of the New York State Veterinary College, Cornell University, principal speaker of the evening. (Dr. Moore was a member of the committee appointed by President Wilson to make a tour of inspection of the packing houses under supervision of the federal government.) Other speakers were Dr. Maximilian Herzog, professor of pathology and bacteriology, Chicago Veterinary College; Dr. S. E. Bennet, inspector in charge, B. A. I., Chicago, and the new president of the Veterinary Association of Chicago.

Dr. Adolph M. Casper, toastmaster. Dr. Casper is one of the oldest veterinary inspectors in point of service at that station.

THE B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF SOUTH OMAHA held a very interesting meeting on the 19th of February. The question of "Hog Cholera" was discussed to a considerable length, Dr. F. Jelen leading the discussion. This association now has about 40 members.

REPORTS OF CASES.

IMPACTION OF THE CECUM IN THE HORSE.*

By A. T. GILYARD, D.V.M., Waterbury, Conn.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

The subject of cecal impaction is one upon which there seems to have been little written. To the best of my knowledge the first description of this condition was written by Prof. Gofton, of the Royal Dick Veterinary College, Edinburgh, and published in the May, 1912, edition of the *Veterinary Record*. In this article, Prof. Gofton gives a very fine and complete description of four cases of subacute obstruction of the cecum, which fully establishes this as a distinct form of so-called colic.

The next literature on the subject is from the pen of the well-known colic specialist, H. Caulton Reeks, F.R.C.V.S., and appears in the January, 1913, number of Mulford's *Veterinary Bulletin*. In this paper the subject is dealt with in that most thorough and comprehensive manner characteristic of all of the valuable writings of Mr. Reeks on the common colics of the horse. Mr. Reeks describes one additional case of this trouble and advances some very plausible theories.

It has been my privilege to meet with two cases of impaction of the cecum in the horse. Strange to say, these two cases of this apparently rare disease occurred within a month, and consequently impressed me quite strongly.

I must confess that during the life of the patients I did not locate the exact portion of large intestine affected, and thought both cases to be impaction of the great colon, but realized that they were atypical. Fortunately, owing to certain extraordinary manifestations, I conducted thorough post-mortem examinations in both cases, the results of which amply pay for the time and labor involved.

My observations during life and after death in these two

* Presented to the Connecticut Veterinary Medical Association.

cases will, I feel positive, enable me to make an early diagnosis should I again meet with one of these cases. As an excuse for my failure to differentiate cecal from colic impaction, I will say that while handling the first I was unaware of the possibility of impaction of the cecum, and in the second case I formed a strong impression that the unusually long duration of the impaction was due to adhesions or deformities of the colon, and failed to give weight to symptoms which I now recall.

The symptoms in my cases differ in some minor details from those in the cases chronicled by the above writers.

I will describe the course of the disease as I have seen it, after which I shall attempt to draw conclusions, which will, I hope, tend to elicit discussions from you which must necessarily increase our knowledge of this disease.

Unfortunately I did not see the first case until eight hours before death, which took place on the sixth day after the onset of the attack. Consequently part of this description is history, which by much questioning I have tried to make complete in the important points.

The subject was a sturdy gelding, one of a farm team, weight about thirteen hundred pounds, age eight years. This team was subjected to hard work and irregular heavy feedings of grain, they were rarely watered between the evening and morning meals. The owner wished water given during the evening, but as is too often the case this was neglected. Relative to the system of watering I will insert an excerpt from Prof. Gofton's writings on this subject.

He says, "I attributed my cases of cecal impaction to one of two causes, but I am not able to assess the relative importance of each nor to say how far they acted jointly.

"Colic cases were of great frequency in this particular stable, and they all ceased suddenly, their cessation coinciding with the simultaneous removal of what I considered the causal factors in operation. The first was the system of watering.

"All of the horses were watered when they returned from work at night and before feeding. From then until they turned out to work on the following morning they had no chance of a drink of any kind. This was altered by giving the horses the offer of a drink after feeding at night and before feeding in the morning, in addition to the existing arrangements.

"Secondly, molassine meal was mixed with the food when prepared.

"Food sufficient to serve 3-7 days was prepared at one time.

"I think the damp molassine lying in the dry feed for 3-7 days injuriously affected it. This was altered by feeding the molassine with each meal instead of mixing it and allowing it to lie for days with dry food."

It is interesting to note that one of these contributing causes, namely, the absence of water between the evening and morning meals, was present in the case under consideration. Also, the exciting cause in this case may be likened to the second contributing cause cited by Prof. Gofton, in that it was such as to bring about fermentation in the alimentary tract, as will be seen by the following:

On the afternoon of Saturday, June 8, a large quantity of green rye was mowed and given to this pair of horses. In a few hours both were showing distressing symptoms of acute indigestion, with both gastric and intestinal flatulence and quite violent pain.

A veterinarian, who was immediately called to treat the animals, exhibited arecoline and resorted to puncture of the intestine in both cases. The mate growing rapidly, regurgitating gas and fluid from the stomach, and suffering again from intestinal flatulence which could not be relieved by the trocar, died late that evening.

Our subject improved, it was said, and after the passage of considerable feces and flatus the pain seemed to stop. The attending veterinarian administered a quart of oleum lini., and, believing the animal to be out of danger, dismissed the case.

On Sunday, June 9, there occurred purgation from the oil of linseed, there was evidence of intermittent dull pain, but the horse ate some bran and hay and drank a bucket of water during the intervals of rest.

The presence of abdominal pain was shown by the animal lying at full length on the left side and occasionally lifting the head to the right flank. The signs of suffering were so slight and the horse appeared so well during the intervals that the owner did not consider the condition at all serious and attributing the pain to the action of the oil, did not call a veterinarian.

On Monday, June 10, the periods of dull pain and the intervals of apparent ease were about the same as on the previous day. The appetite was more vigorous and there were two practically normal bowel movements. More water was taken and urination was said to be frequent, and again professional advice was not sought.

On Tuesday, June 11, the only change noted was in the ap-

pearance of the urine, which was described as thick and cloudy, being voided frequently in small quantities.

On the morning of Wednesday, June 12, the horse showed evidence of having suffered more acutely during the night. The head, knees and hips were bruised. The periods of pain were longer and the intervals of rest were shorter. There was considerable straining to micturate, but the appetite was not entirely absent.

Another veterinarian was called, who, after having administered an hypodermic purgative, from the action of which there resulted quite a free passage from the bowels, left a stimulant and arranged to call again on the following day.

On Thursday, June 13, there was less pain and more appetite than on Wednesday. The attending veterinarian found sensitiveness in the region of the bladder on rectal exploration, and as the urine was very cloudy prescribed a refrigerant and alkaline diuretic.

Palpation of the bladder seems to have produced so much straining that further exploration was impossible.

On Friday, June 14, I saw the case for the first time. On being hurriedly summoned, at 8.30 a. m., I found the horse in a serious condition. The owner said that there had been a decided change for the worse during the two hours previous to my arrival. The symptoms were very puzzling, the pain was then of the type which causes the horse to step quickly back and forth, look anxiously to one flank and then the other, crouch as if to lie down, then straighten up and paw. The respiration was of the puffy type. There was patchy perspiration, but still the pulse was fairly soft and smooth at sixty per minute, and the general circulation seemed good, with no chilling of the extremities.

As neither the history nor the external manifestations enabled me to make a diagnosis, I then proceeded with a thorough rectal exploration, which soon revealed to a certain extent the nature of the trouble. The rectum was empty and dry, the intestines in the pelvic region were flaccid, on advancing to the right flank region the hand encountered a very severely impacted large intestine, which was sensitive to palpation. The posterior and lateral faces of this bowel, as far as could be reached, were irregularly rounded.

Superiorly the viscus seemed to be attached to the roof of the abdomen in the sublumbar region.

Judging from the form, location and attachments of this obstructed portion of intestine, I immediately mistook it for the

voluminous extremity of the great colon which so suddenly draws in to join the anterior extremity of the small colon. Often having found this part of the great colon impacted, I thought it nothing out of the ordinary.

In view of the sensitiveness on palpation and the long duration of the attack and the seriousness of the general condition, I considered the outcome quite doubtful, and so informed the owner.

However, as the owner believed very strongly in the old adage, "where there is life there is hope," he insisted that I give treatment.

The stomach tube was passed, and after having emptied the stomach of two or three gallons of fluid, in which floated a small quantity of food, we pumped in three gallons of warm water, in which had been dissolved 24 ounces of magnesium sulphate and 8 ounces of sodium chloride.

After having withdrawn the tube I administered a regulation aloetic cathartic bolus and left nux to be given every four hours.

The foregoing has been for the past two years my never-failing treatment for subacute impaction of the colon when the cases have been seen at a reasonably early date.

At four p. m. the owner again phoned that he wished me to come immediately; on my arrival I found that a decided change had taken place since the morning. Horse was covered with perspiration, the pulse at the jaw could not be counted, and the artery felt like a small hard cord. The extremities were cold and the shoulder muscles were in a constant tremor. Per rectum I detected the presence of ingesta floating free in the peritoneal cavity; this I attributed to intestinal rupture and told the owner that the horse must surely die in a very few hours.

I then made arrangements to hold a post mortem the next day at six a. m. Soon after my departure the owner had the animal led to a field, where he died after about an hour's suffering.

At the autopsy I was surprised to find the cecum instead of the colon impacted and ruptured, its walls were darkened and easily torn. The remainder of the intestinal tract was practically empty save for a small quantity of ingesta of the consistency of pea soup.

My second case occurred in a twenty-year-old mare weighing about 900 pounds. This mare was one of a stable of nine horses used for delivery purposes by a grocery firm.

These horses were fed oats, bran and hay, and were allowed water when brought in from work just before the evening meal,

but received no more until after breakfast when harnessed for the day's work.

On the morning of July 1st, this mare and an old gelding from the same stable were driven to the hospital within an hour of each other; both showed symptoms of colic.

By auscultation and percussion of the flanks I determined the presence of too much gas in the intestines. This acute fermentative indigestion I attributed to faulty food.

Each horse received subcutem one grain of physostigmine salicylate and per orem a capsule of betanaphthol and powdered nux, and both were sent home to be placed in box stalls and await results.

After about two hours I made a visit and found that the eserine had in both cases caused the evacuation of large quantities of feces and flatus, but the pain still persisted, although it was not as severe as while purgation was taking place.

When I again saw the cases in the afternoon both were still uneasy and I had them taken to the hospital.

The gelding soon eased up after the walk from the stable, but the mare continued in dull pain, with pulse full and soft at forty per minute and respiration slow but slightly labored, and temperature normal. In the evening, per rectum, I discovered in the right sublumbar region an impacted intestine, large, round and very hard, and seemingly attached superiorly.

This I took to be the last portion of the colon and confidently administered the magnesium sulphate and sodium chloride treatment through the stomach tube and followed this with an aloetic pill.

During the following day, July 2d, there were several watery evacuations accompanied by some pain, which I attributed to the purgatives. As there was some appetite for hay and water I gave the case little attention.

On July 3d the dull pain continued, although the mare ate some bran and hay and drank a pail of water.

I made a rectal exploration to determine the cause of the pain and found the impacted intestine apparently unchanged since July 1st and was sorely puzzled. I repeated the treatment given on the first evening. On the next day, July 4th, the mare again purged and the stools contained a few whole oats, but the impaction was not perceptibly changed.

From the first until the seventeenth of July I tried, except laparotomy, every means within my knowledge to remove that impaction; all to no avail.

I used eserine, arecoline, barium chloride, aloes, aloin, magnesium sulphate, sodium chloride, oleum lini, etc., augmented by large quantities of water by the stomach tube and by rectal injections both hot and cold. In the application of the rectal injections I sometimes attached the tube to the city water and continued it for hours, this I think, gave better results than anything else used, sometimes bringing away quite a quantity of whole oats, none of which had been ingested since the beginning of the attack.

During these seventeen days I continued stimulation in the form of strychnine and powdered nux vomica, twice I pushed the latter to the limit, once until the mare was unable to gain her feet for a period of four hours.

On the evening of July 17th the mare seemed to be in about the same condition as she had been since July 1st, but on the following morning she was much worse, in great distress, labored breathing, rapid wiry pulse and patchy perspiration.

Per rectum I discovered the presence of ingesta in the peritoneal cavity, denoting a rupture; whereupon I shot the poor creature. The post mortem showed the cecum to be full of almost dry, closely packed ingesta with an eight inch rent near its base.

The remainder of the intestinal tract was practically empty.

From my observations in these two cases I firmly believe that impaction of the cecum is caused, primarily and fundamentally, by the lack of water in sufficient quantities and at the proper time to keep this reservoir of the system filled with fluids.

We know that horses coming from work at night and expecting food will not, as a rule, drink water in very great amount until this appetite for food has been satisfied. We know that horses will drink eagerly and at length if water is offered them two or three hours after the evening meal; how many times we have seen a horse stop eating hay during the evening and refuse to eat more until after having had water.

Physiologists agree that the contents of the cecum are always fluid or of the consistency of pea soup. I know that I have at post mortems, except in these two cases, always found this to be true.

I think that Frank Smith, in his work on Physiology, hits upon a most plausible theory when he suggests that the ingesta may pass directly from the ileum to the colon without entering the cecum. To accomplish this the firm, muscular, nozzle-like extremity of the ileum would have to be carried upwards and

into the entrance of the colon, there to discharge its solid contents.

I will go one step farther and suggest that if the above be true, and I have reason to believe that it is, may not this muscular extremity of the ileum or so-called ileo-cecal valve, possess a selective power on solids, semi-solids and fluids similar to that of the oesophageal pillars of ruminants?

This would enable the ileum to discharge its coarse, practically indigestible solids directly into the colon and its fluids, containing the great majority of the soluble and diffusible matter, into the cecum, where it could be quickly taken up by the blood.

Presuming this to be possible we may assume that in the absence of water in sufficient quantities to keep the cecum at its normal status of distention, collapse of its walls would occur and disturbance of this presumed selective power of the ileo-cecal valve could result and solids be discharged into the cecum until this reservoir became distended.

Following this, whatever diffusible fluids were mixed with these solids would be quickly taken into the blood in the natural way and a firm, dry impaction of the cecum would be the result.

The very form of the cecum, with its outlet close to and higher than its inlet, makes it impossible for this organ to get rid of a large solid mass in any manner that I can at present conceive of.

When we have an impaction of an intestine through which the ingesta pass as through a tube and are carried along by the peristaltic movements of the bowel walls, the proposition is entirely different. In a case of this kind it is easy to see that fluids taken by mouth or secreted by the intestines would be carried along to the solid mass, which upon being softened by the mechanical action of these liquids could be moved on by the action of a peristaltic stimulant.

On the other hand, in the case of the cecum, we have what may be practically termed a blind pouch, and we may not depend upon this, what I choose to term, washing action of the fluids.

In the tube-like intestine, the liquid with peristalsis forcing it along must work its way into the impaction and disintegrate it.

But in the case of the cecum, when we have this large reservoir entirely filled with an impacted mass, it seems to me that the most natural course for any fluids entering through the ileo-cecal valve is directly out by way of the nearby entrance of the colon.

This theoretic sudden discharge of an abnormally large quantity of liquid into the colon, I think, accounts for the prodromic diarrhoea described by Gofton and later by Reeks.

So far as I could determine this looseness of the bowels did not precede my cases, but I think that I saw its counterpart in the acute colicky symptoms shown at the onset of the attack, which I attribute to the colon's receiving this unusual quantity of ingesta whose ingredients were not of a type upon which the colon is capable of acting. Consequently, fermentation rather than digestion ensued, and flatulence was the consequence.

In the event of my again meeting with a case of impaction of the cecum I have decided that I shall depend principally upon water to remove it. After having made a positive diagnosis, I shall first thoroughly empty the remainder of the alimentary tract by saline purgatives administered through the stomach catheter and withhold all food. Following this I shall use the tube not once but many times a day and each time I shall pump in just as much water as I may judge, by back pressure on the pump, that the horse will stand.

If this fails, after having thoroughly washed out the rectum I shall carry in through this clean gut a trocar which I shall plunge through the rectal wall into the impacted cecum; to this I shall attach a tube and pump in a lot of water in an endeavor to mechanically loosen the obstruction.

These two methods may seem rather far-fetched and the latter of course is risky, to say the least, but I am satisfied that no common means will do the trick.

In defence of my plan to introduce a large quantity of water through the stomach tube I will cite a similar condition, that of true impaction of the rumen in bovines, in which I have had very pleasing results from the use of this method.

I never had a true case of complete impaction of the rumen recover until I conceived of the idea of passing a tube far into this great reservoir, which I consider is in a great many ways similar to the cecum of the horse, and of introducing as high as twenty gallons of warm water, containing saline purgatives.

This treatment has so far never failed to effect an evacuation of this organ except in one case, which I afterwards found to have been caused by tuberculosis.

Likewise, in this disease I considered that water in such quantities as the subject could be induced to drink or that could be given by drench would pass by the full rumen and enter the other stomachs and consequently fail to reach the mark, as would also any medicaments dissolved or suspended in the water.

When conventional treatments continually failed in this almost parallel condition this treatment was successful; and I think it not improbable that it will also do the work in impaction of the cecum; although in this case of course the tube can not be introduced directly into the affected organ.

I hope now to hear candid opinions from all of you on the disease in question, and I realize that I have treated this large subject in a superficial manner. Please do not hold any good ideas back just because I seem to have made some wild statements.

NOTE—In the literature on the subject, the author has overlooked a valuable contribution from Willis Wilson in the May, 1913, issue, page 151, AMERICAN VETERINARY REVIEW, under the caption *Equine Typhilitis with Impaction*; in which the post-mortem findings, as we remember them, are identical with those of the author. Dr. Wilson described the symptoms observed very carefully, having met fifty cases up to that time. We invited a discussion on this interesting phase of "colicky" conditions at the time, and now, with this excellent report of Dr. Gilyard's, feel sure that discussions will continue. [EDITOR.]

A HEART ANOMALY.

By ANDREW ENGLISH, B.A.I., Veterinary Inspector, South Omaha, Neb.

Nature's laws are very certain and it is not often that the various organs of the body are found outside of their prescribed limits.

Cervical ectopia cordis is the technical name used to signify that the heart is situated in the cervical region.

This powerful complex muscular structure has a very simple beginning. The heart-fundament is normally formed in the cervical region in the early stages of embryonic life. As the splanchnic walls approach each other, they bring together the two tube-like structures, which coalesce and form a single straight mesodermic tube in what will later be the cervical region of the body. This tube by bending, by unequal growth and by differentiation of its structure will be the future heart. The unequal growth of the surrounding structures usually change the situation of the developing heart to the thoracic cavity.

Thus an explanation for the unusual situation of the heart in the neck of a three- or four-year-old cow must be given as of congenital origin.

Besides the peculiar situation of the heart in the neck, this case presented other anomalies which will be briefly described.

The neck gradually turned to the left until at the atlas the turn to the left was quite sharp. See Photograph I. The heart was situated in the shorter curvature of the torticollis. The first few ribs curved unequally in their length and with the sternum



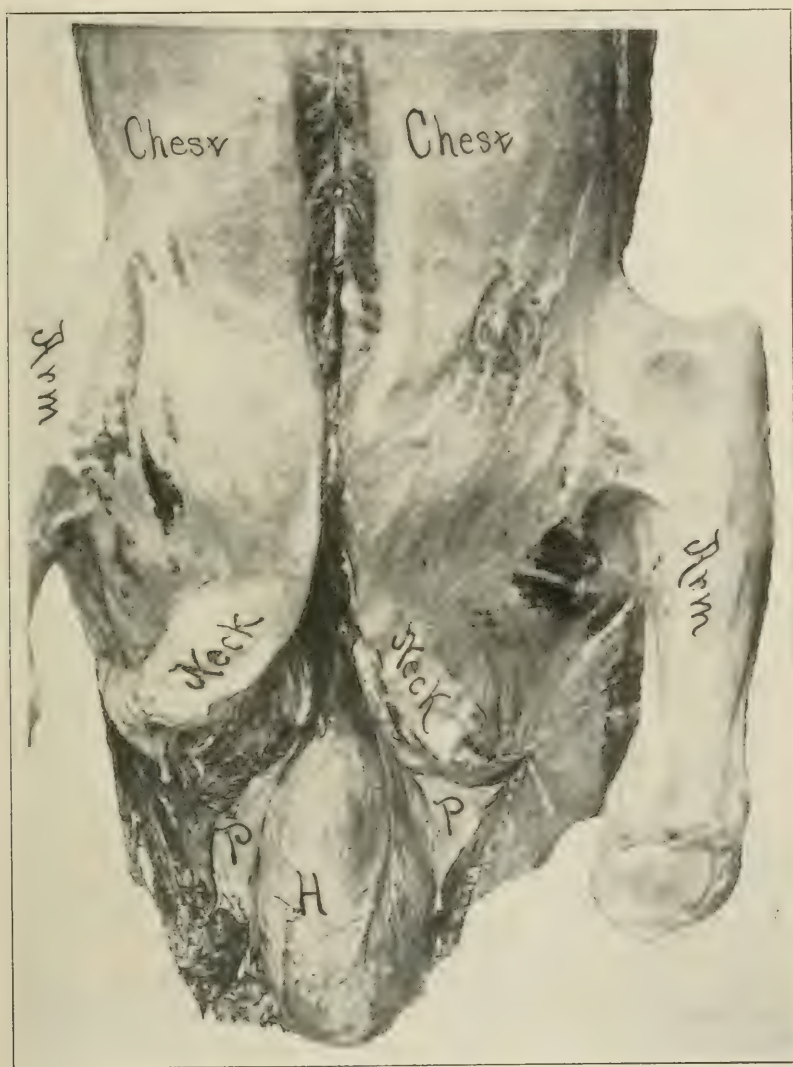
PHOTOGRAPH I.

Back View.

Carcass hanging from hooks with the neck downward. "H." situation of the heart.



PHOTOGRAPH III.



PHOTOGRAPH II.
Front View.

Carcass hanging from hooks with neck downwards as in Photograph I. "H," heart.
"P," pericardium.

formed a very broad and flat chest. The forelegs were wide apart. See Photograph II.

The opening between the anterior thoracic walls being very

large gave ample room for the entrance of the large blood vessels to and from the heart into the chest.

The pericardium extended eight or nine inches outside of the thoracic cavity and was attached on the left side of the bodies of the cervical vertebrae. The trachae and oesophagus were situated on the right side of the heart sac and were attached to it. The oesophagus turned gradually in its relation to the trachea and as it entered the thorax was on the right side of the trachea.

The diaphragm turned sharply as it left its rib attachments to become attached about midway on the sternum.

The lungs had on the left side two lobes, the diaphragmatic and one small lobe while on the right side was four lobes, mediastinal, diaphragmatic and two well detached small lobes. The normal position of the heart was occupied by lung tissue.

The heart was nearly cylindrical in form. See Photograph III. The heart lay on its side in the cervical region, the apex anteriorly and the blood vessels to and from the heart posteriorly.

Cow killed February 23, 1912.

BOVINE FŒTUS AFFECTED WITH HYDRO-CEPHALUS.

By Veterinary Surgeon DESMOND, Adelaide, South Australia.

The following notes on an interesting case may be of value in placing on record a remarkable abnormal condition of the head of an unborn calf. This remarkable abnormality was received by me from the dairy farm at which I treated the outbreak of epizootic abortion reported in the September, 1913, number of the AMERICAN VETERINARY REVIEW.

The following notes are the particulars, which are as complete as can be made without dissecting the head, a proceeding which would destroy its value as a specimen. The head alone was brought to me in a sack, and had an incision in its most prominent part of more than six inches long, which, I am told, was a cut with a butcher's knife, made to see what the head contained.

These are the facts related by the owner of the dairy farm: The cow was of a very common breed, and the fœtus was the second calf; the first calf was healthy, and was born without assistance.

The cow was irrigated with the others in the treatment pursued for stamping out the outbreak of epizootic abortion, and was one of those whose genital organs admitted the full length of the pipe.

Symptoms of pregnancy were noticed about the seventh month, but after a few days they subsided, when the hair appeared to be rough, and the animal out of condition, with a faint trace of the pelvis becoming smaller. After a few weeks the cow was noticed to be very swollen in the flanks, in fact, abnormally swollen; the vulva was contracted, and the anus drawn in. This puzzled the owner very much, as the cow had gone beyond her time to calve. The cow became so large that an opinion was formed that she must have twins. The animal was kept under observation in a small paddock near the house, in case assistance would be required. While under observation the cow did not seem to suffer any pain, and partook of her food in the usual manner.

The owner was much surprised on going one morning to see how the animal was to find her dead. Death seemed to have taken place without a struggle. He at once decided to remove the hide and cut up the carcass to ascertain the cause of the phenomenon, and then burn the remains; burning is resorted to in all cases of death on the farm, as a means of preventing the spread of contagious diseases. After removing the skin an opening was made in the flank, as the cause of death appeared to be in that region, through its being very much swollen; and he was surprised to find a large quantity of clear fluid in the uterus, estimated to be not less than fourteen gallons. When he had opened up the flank sufficiently to see the calf, he was struck with the size of its head. It was a male calf, and in a natural position. When he had taken the calf out, he ran the knife across its head and found a clear fluid exactly resembling that in the uterus. The calf, with the exception of the head, appeared to be like any other calf, and did not seem larger than one dropped at full term. After the calf was examined, the cow was cut up to facilitate its burning, the carcass of the calf being thrown upon the heap, dry wood piled on top, and the whole set fire to. The fire had been burning for some time when a neighbor, the same who brought me the head, came over to see the cow, and was so much interested in the strange appearance of the head of the calf, which the fire had not yet reached, that he took up an axe and severed the head from the body just behind the ears. When the farmer was asked why he did not keep the cow and the calf for me to

examine, he replied, "I was disgusted with my losses and thought that some new disease was going to break out in my farm."

The following is a description of the head, with measurements:



The color of the hair is red on the lower part and white on the upper part; and the hair is much longer and stronger than is usually seen on a calf at full term.

The shape in that portion of the head which is abnormal approaches a spheroid, the largest surface being the top. The bones in the abnormal portion appear to be one-eighth of an inch thick, and they terminate with the red-colored hair (as indicated by the dark shading in the accompanying illustration), where they are very thin and more like cartilage, with an undulating edge—that is, high in the front, running up to a point, with a base 4 inches wide opposite the nose, then for 5 inches running upwards to the highest point at the sides.

There is a V-shaped cleft at the back, with a measurement of, top, $5\frac{1}{2}$ inches; sides, $5\frac{3}{4}$ inches. Diameter across the head

from front to back is 12 inches, and from side to side at widest part 15 inches.

The following are the measurements of the stuffed specimen, as shown in the plate: From bottom of lower jaw to top of head, taken at an angle from upright position, 18 inches; from front to back, 14 inches; from side to side at widest, 18 inches.

The most curious features are the forehead, with its rough, curly hair appearing to be at the back of the head, and the ears which, although they look forward, are upside-down. A dissection is the only means of telling if the bones at the back which look like the forehead are really the bones of the forehead or not. The front teeth are very large for a foetus, the middle teeth measuring across the upper surface half an inch. The mouth is complete, with teeth, tongue, palate and pharynx normal; the œsophagus and trachea are to be seen in a normal position. While the eye-lids with long eyelashes are perfect, the eyes are rudimentary and sunk below the bottom eyelids. The measurement across the eyes from the anterior edges is 8 inches. The ears are large and long, measuring $2\frac{1}{2}$ inches broad and 4 inches long from base to tip. Measurement from tip of nose to base of ear 9 inches.

Description and measurement of the cranial cavity: On viewing the inside of the head, what comes prominently into view is the end of the spinal cord, which has the appearance of a number of fine woolen threads of irregular lengths, some 3 inches long, others not more than half an inch. Dura mater and pia mater intact; no trace of brain to be seen. The membrane lining the cavity is perfectly smooth and of a dull color.

No trace of the optic nerves can be seen; in fact, the membrane is as smooth as a dried bladder.

On the floor of the skull, at the point where the spinal cord passes through, is a triangular cavity that would hold about 8 fluid ounces, with sides measuring 5 inches; it is formed by a thin membrane extending from a rounded point facing the anterior aspect and running upwards, joining the head at the back; the walls of this membrane are 2 inches high.

The specimen measures from the bottom or floor, at an angle, to the top of the undulating edge of the bones, at the highest part 16 inches; from the lowest part in the V-shaped cleft in the back part of the head, 18 inches. In giving these measurements it is to be noted that the back part of the head is lower than the bottom jaw.

The following measurements may serve to gauge the capacity

of the head: From floor of cavity to top of head, distended, 16 inches; diameter at widest part across the head at the highest point of the bones, 18 inches. Taking the diameter at the part above mentioned will give a fair average, as the base is smaller than the top; the top part of the head, above the bones, projects forward when it is distended with fluid and holds between 4 and 5 gallons.

SCHISTOCORMUS REFLEXUS.

By A. S. TODD, D.V.M., Stevenson, Ala.

On arriving at a farm some five miles from my office, I found a cow in labor, and with such severe pains that she would bellow almost continuously.

She was standing but was very weak.

On examination I found one head and two forelegs presented, as though they belonged to one calf, and two hind legs presented above the head, with the points of the hocks against the roof of the pelvis.

I concluded by that that I still had two calves to deliver, although the cow had given birth to a nice heifer calf about forty hours before I was called, and at once haltered the head and secured both forefeet.

It seemed that traction would not remove the one presented until the hind legs were disposed of; so with a repeller I pushed everything back.

When I had room enough to pass my hand and arm around the body, imagine my surprise at what confronted me.

It was impossible to force the hind legs back into any position favorable for delivery, so I had to bring the whole mass together.

It was only the work of perhaps ten minutes to complete the delivery.

The calf was completely wrong side out.

The picture No. 1 shows the spots on the hide with the legs spread well apart.

Picture No. 2 shows the ribs devoid of hair, running lengthwise of the body and to the edges of which the hide had grown fast.

The heart, lungs, stomach, liver, spleen and bowels were completely exposed.

It weighed 32 pounds.



The first position shows calf spread open to show spots on hide. Bowels show from behind. Vulva is located where udder should be.



This is the second view showing the ribs devoid of hair and entrails *all* exposed. Heart, lungs, stomach, liver, spleen and bowels. The ribs appear to run horizontally. The hide was grown fast to the borders of the ribs.

The vulva was where the udder should have been.

The cow made a good recovery and the first calf is living and healthy.

ACUTE INDIGESTION IN A COW-RUMENOTOMY.

By CHAS. H. HART, M.D.C., Hankinson, N. D.

Was called hurriedly to a farm about three miles east of town, the farmer stating that he had an awful sick cow; and sure enough he had. On arrival I found the worst case of acute in-

digestion it was ever my good fortune to see. The cow had already been "tapped" with a pocket knife by the owner, but he said, "I cannot get any gas."

History.—They had been threshing the day before on this farm, and the cow had been feeding round a straw stack and had eaten an enormous amount of weed seeds, broken grain and straw.

Symptoms.—The cow was bloated to an enormous size, her eyes seemed to be sticking out of her head and she was making a kind of moaning noise. I considered for a moment what to do; pass the stomach tube or perform rumenotomy. I decided on the latter.

The Operation.—It was a pitch-dark night, threatening to rain (which it did before I got through), and no convenience for such an operation. With the assistance of the farmer, I securely tied the cow to the side of a wagon and operated.

The usual operation was performed. On cutting through the rumen, a stream of semi-liquid food in a state of fermentation gushed out and continued to run for two hours; at least one hundred and fifty pounds ran out before it stopped. I then removed by hand probably fifty pounds more.

The wound was then thoroughly cleansed, the paunch sutured with catgut, and the skin with thread. The cow made a good recovery. Just six weeks after the operation she gave birth to a fine, healthy bull calf and both have done well.

WHAT WAS IT?

By WALTER LAWSON, D.V.S., Hollister, Cal.

Eleven puppies and one older dog died.

Three recovered after same symptoms.

Probably half of them had discharge from eyes and nose in the beginning; one was wormy, and after a purge, many worms came away; then the symptoms which I will describe followed. Frothing at mouth during fits, champing of jaws, no appetite, running or walking in a circle, sometimes running away, hiding, or wandering away in delirium.

No symptoms of lower jaw hanging, or biting.

One head sent to laboratory and examined by some student (I think) was reported rabies. Report on second head was, no Negri bodies found. Report on third head, rabies.

These puppies were from two to four months old.

Some had never seen a dog since weaned from the mother.

The heads were examined three to four days after death.

Nothing furious or violent about the puppies.

I have had one of them since December 24; it had fits many times, but is well now, except partially blind.

I assume that these symptoms are from worms, indigestion and distemper.

If rabies is contagious or spontaneous, probably that is the cause.

Another fact is, that nothing but puppies are affected, and no rabid dog has been known here to date.

Please give your opinion.

NOTE—Our inference from your account of these puppies and the older (young) dog is, that they were suffering from intestinal parasites and distemper, with epileptiform convulsions as a result of those conditions. The laboratory report of rabies notwithstanding. These convulsive symptoms are not uncommon in puppies that are poorly fed, badly nourished, or teething. It also frequently occurs as a consequence of reflex irritability, such as might result from a catarrhal disease of the digestive tract (distemper) or intestinal parasites. [EDITOR.]

PLACENTA FOUND IN RUMEN OF COW.

By WALTER LAWSON, D.V.S., Hollister, Cal.

I was called eight days after a cow had calved.

She was staggering; temperature 101; ears, horns and legs cold.

I diagnosed digestive trouble. The next morning she was dead.

On post mortem I found the placenta in the rumen, and it had collected around it hay to the size of a stove pipe.

No sign of decay, tough as when shed from the uterus.

I have read of and seen cows eat the placenta, and think some of the cases that have no appetite after calving are probably due to that cause.

The Bureau of Animal Industry Employees of South Omaha held a farewell reception on the evening of the 20th instant, in honor of Dr. F. Jelen who has been transferred to Cedar Rapids, Iowa, as inspector in charge of the meat inspection station in that city.

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

A CURIOUS ACCIDENT [*W. W.*].—A large retriever has thrown to him to fetch a walking stick some 2 feet long with a crook handle. All at once, while running with the stick in his mouth, the stick disappeared in his throat, with the exception of the handle. With difficulty it was pulled away. A little blood only followed, and the dog seems all right, remaining so for a week, when he seemed ill, showing rigors, general disturbance, no appetite and a temperature of 104. Examined, the dog was found to have a large ulcerated wound in the left side of the tongue and a big cyst near the upper part of the postea-spinatus muscle. This was opened, the sore in the mouth attended to and the dog made a rapid recovery.—(*Vet. Record.*)

A TERRIBLE ACCIDENT TO A RACE-HORSE [*F. B. Eve, M.R.C.V.S.*].—The illustrated concise record of the case of a race-horse, which, whilst finishing the course in a race, ran into the end part of the fence on the inner rail, and this entered inside and under the shoulder blade, the impetus carrying it through the body and causing the pole to protrude for fully 3 feet beyond the hip. The horse swayed for a few moments and dropped dead. It was a terrible and certainly a unique accident.—(*Vet. Journ.*)

SKIN LESION OF THE HORSE RESEMBLING DERMATITIS ERY-SIPELATOSA [*Mr. W. G. Berry, M.R.C.V.S., and W. W. Noel Pillers, F.R.C.V.S.*].—A case illustrated with photos, the subject being a cart gelding, aged 11 years.

After a severe febrile attack which was followed by double pneumonia, which the animal pulls through, and while a few days of convalescence was given before being returned to work, the animal one night has a peculiar skin rash, with a febrile reaction of 102° F. Then came marked swelling of the hind quar-

ters, inflamed and sore. The inside of the thighs below the perineum were moist and steaming. The body was scattered with number of large patches, painful blotches. Small elevated areas were on the lips and face. The hair first became erect, then there was an accumulation under the skin. The size of the lesions varied. In a few days the raised skin became hard and dry, and crusts formed with pus-like fluid underneath. After two or three weeks the lesions gradually disappeared. During the disease the pulse had been first very irregular and later more steady. The general condition, however, remained fair. Examination of the lesions for acari and ringworms were negative, and positive diagnosis was not made. The treatment consisted in light diet, iron sulphate and vegetable tonics being given internally. Local applications on the sores did not seem to do much good. Eventually all the crusts had fallen off and after some time the horse was able to resume his work.—(*Vet. Rec.*)

AN ABDOMINAL LESION [*R. F. Stirling, F.R.C.V.S.*].—Valuable mare of five years had been turned out and partook of a too large quantity of stacks of barley, resulting in colic which was only temporarily relieved, and the writer was called to see her. Temperature 104.8 F. Pulse 90 small. Membranes injected. Face was "drawn" and there was frequent turning up of the lips. Spasmodic colics now and then. Borborygms barely noticeable. Rectum dilated and empty. Treatment oil, digalon hypodermically, chloral. This was followed the next day with strychnia and digalon and enemata repeated. Rectal examination reveals the presence of small feces in the rectum and on pulling it out it proves to be a perfect cast of the bowel containing hardened feces. The cast was 4½ inches long, had the shape of a tube, fairly tough and black in color. After the removal of this cast, liquid feces came out, mixed the following day with blood. Nuxvomica, digitalis were prescribed and the enematas continued. Gradually the mare made a perfect recovery.

The interest of the case for the writer was that he had never seen such in horses, although he had witnessed it in cattle on several occasions.—(*Vet. Rec.*)

RUPTURE OF THE UTERUS IN A COW—A WARNING! [*L. W. Wynn Lloyd.*].—A five-year-old cow has been off her feed for some days and constipated.

Temperature is subnormal, pulse weak, extreme dullness and enlargement of the abdomen. The animal moans every few sec-

onds. On examination of the uterus, the os is found fully dilated and a little further, on the left side towards the floor of the womb, there is a rupture, large enough to admit a calf's head. The foetal membranes were ruptured and to all appearance the calf had been dead several days. After giving a bad diagnosis, which the owner did not seem to accept, the calf was removed, not without some difficulty, and the animal left to herself. Wonderful as it seems, the cow got well, much to the satisfaction of the owner who had a good joke on the veterinary attendant.

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

FILARIOSIS OF HORSES [*Dr. Monbet*].—The toxic property of permanganate of potash towards *Filaria irritans* of horses has caused it to be recommended in the treatment of the cases of dermatitis, summer wounds, which are so difficult to cure and so rebellious to remove radically. The writer has used it in one case where instead of waiting for the moment where the parasites were in their maximum of vitality, he applied the treatment before the wound would be fully developed, namely in the ugly cutaneous surfaces where this was likely to appear. It is known that these summer wounds leave contracted cicatrices and that under the stiff and rude skin the palpation will detect the enveloped filaria feeling like small encysted shots. The writer in a gelding which for several years had been laid up for filariosis, injected all round and in different spots of the cicatrix, 60 c.c. of aqueous solution of permanganate of potash, 1 p. 1,000 and massed the surfaces towards the center. The injections were followed by an oedematous swelling which disappeared after a few days.

Result.—No more new granulating wounds were formed, some old cicatrices became more supple and if the cysts of the filaria were still detected by palpation, the parasites were dead. Although but one case, it suggests its application in other filariosis.—(*Rev. Gener.*)

NYPHOMANY IN COWS [*Mr. Ivendiesse*].—As treatment clitoridectomy and ovariectomy are recommended; the first is easy but not without failures. The second is the choice operation even with its objections. The author has resorted to the method of Mr. Floire, which consists in the introduction of a conical lead

ball weighing 20 to 30 grammes in the uterus. With this treatment he has observed that the genésic excitement of the cow would radically pass off for 10 or 15 days, but would reappear after, although less severe. Ivendiesse has modified the method. He introduced 5, 6 and 7 balls of 30 to 40 grammes each. Every time he obtained perfect success. Thin, worn-out cows would return to healthy condition in a few days. The operation is simple, especially if one operates in full stage of the crisis when the uterus is sufficiently open at the neck. The trouble is said to never return.—(*Prog. Véter.*)

SEPTICEMIA FOLLOWING INFECTIOUS PHLEBITIS OF THE RIGHT HIND LEG [*Doct. Attal and Chicon, Army Veterinarians*].—A four-year-old horse walks stiff. The right hind leg is a little swollen, painful on palpation, temperature is high, $40^{\circ}3$. There is no external wound detected. On examination of the chest pulmonary congestion is detected on the right side with a small point of dullness. The heart shows myocardic insufficiency; there is a little tachycardia. Ocular mucous membranes cyanotic. A diagnosis is made of phlebitis with embolus having caused a focus of infection on the right lung. Treatment, bleeding at the jugular, salines, purgatives, mustard on the chest, digitaline and caffeine. After four days improvement is marked but the heart keeps on weak, the swelling of the leg increases. The animal, however, keeps laying down, when standing he does not rest on the lame leg. Pains increase, abscesses and fistulas open on the course of the saphena veins, yellow pus mixed with blood escapes. After a few days the horse dies. Post mortem. The right hind leg is infiltrated, especially on the shank and thigh. Old bruises are found on the upper part of the canon. Above the hock are two fistulas from which bloody pus is squeezed out. In the abdomen the lymph glands are enlarged and hemorrhagic. Liver, spleen and kidneys congested. Slight lesions in the lungs, pericardium contains fluid, myocardium and endocardium show bloody effusions, specially on the left ventricle.—(*Journ. de Zootech.*)

NEW TREATMENT OF SARCOPTIC MANGE IN HORSES [*Mr. Perot*].—The mangy horse is placed in a stable, heated to a temperature of 20 to 25 degrees C., where he is left for two or three hours. After this lapse of time, a good washing is made with castille soap and warm bareges (sulphurated water) solution at 1 p. with rincing with pure bareges and leave the animal

to dry by the heat of the stable. No case of mange will resist the treatment which in five sittings is followed by recovery. Five or six days must be left between each washing to allow the eggs of the parasite to hatch and before the new parasites can lay any more. This mange transmissible to men is readily cured with the same bareges solution.—(*Bullet. de la Soc. Cent.*)

OSTEOMAS OF THE SHOULDER [*Mr. A. Chazeau.*].—Under this name the author calls the attention to growths which develop only in equines at the regions where cold abscesses are observed. Although the name of osteoma is scarcely proper as these growths are not bony but their clinical characters justify this denomination. The difference between these tumors and cold abscesses is that they never contain pus and that no matter how many exploring punctures are made, and no matter how deep, pus has never been detected in them. At the onset and during its development, they are very large and hard, appearing suddenly without edematous swelling round them. They are not painful and if the collar worn by the animal is sufficiently wide, he can work. They are so hard that puncture with the hot iron is even sometimes difficult. The treatment is long, generally demanding two months for the growth to be resorbed. From four to five punctures, 5 and 6 centimeters deep, with a large old fashioned pointed firing iron with injections of tincture of iodine diluted with half water is necessary.—(*Rev. Gen. de Med. Vet.*)

ITALIAN REVIEW.

By A. LIAUTARD and E. CESARI.

GROSSICH'S METHOD IN VETERINARY SURGERY [*Dr. O. Porri*].—The disinfection of the field of operation with tincture of iodine, recommended by Grossich, in 1908, is without doubt superior to all the other methods that can be used in the practice of veterinary surgery. The writer has used it for three years and can appreciate its superiority. All that is required is to paint the skin over, two or three times, with an alcoholic solution to obtain a complete disinfection.

The author has obtained surprising results in the following surgical interferences that he used it: Two phalangeal disarticulations, two castrations in dogs, several castrations by ligature of the cord in horses and calves, two neurectomies, three tracheoto-

mies in horses, four paracentesis in cattle, one enterocentesis in a donkey, two patellar dermatomies, several foot operations, removal of tumors, etc.

With some subjects there was a peculiar susceptibility to iodine. In one dog, which was castrated, the tincture gave rise to serious squamous dermatitis. Such accidents are rare and do not modify the result of the operation.

For some authors they are due to the presence of iodohycc and, which forms in the old preparations, hence the indications of using only recently prepared tincture.—(*Il Nuovo Ercolain.*)

SURGICAL ANTISEPSY WITH TINCTURE OF IODINE [*A. Macellari*].—The writer claims the priority of the use of tincture of iodine as cutaneous disinfecting agent, in favor of Veterinary Professor Aruch, an Italian, who published in 1894 in *Clinica Veterinaria* an excellent paper on the subject.—(*Il Moderno Zooiato.*)

ON BANG'S BACILLUS [*A. Arcoli*].—The specificity of the bacillus of epizootic abortion, discovered in 1897, by Bang and Stribold, has been confirmed by the works of the English commission, by Preisz in Hungary, Mowack in Austria, Zwick in Germany, McNeil and Meyer in North America.

The culture of the bacillus presents some difficulties, and those made with Bang's method (on agar-gelatine serum without layer of agar) give many failures. Nowack improved the method by keeping the culture in confined atmosphere in common with a reducing germ, the bacillus subtilis.

Theobald Smith rendered the isolating of the bacillus easier in showing that rabbits and guinea pigs were susceptible of the B. of Bang-Stribold, which produces in those animals lesions of the spleen in which the germ is found in a pure state.

Arcoli has first used a method of culture analogous to that of Nowack, but changing only the agent of symbiosis by the bacillus anthracis. The suspect material is first inoculated to rabbit and cultures made with splenic lesions of this animal.

According to the author, a method that gives excellent results consists in making a culture with a small piece of spleen in a tube, sealed with the spirit lamp afterwards. Or again in a tube, containing a piece of spleen, from a non-infected animal, always sealing it with the spirit lamp after the sowing is made. The medium used by the author is ordinary gelose containing a few

drops of horse serum in water of condensation.—(*La Clinica Veterin.*)

RARE CASE OF RECOVERY FROM FRACTURE OF THE NAVICULAR BONE IN A HORSE [*Dr. G. Ranzani*].—The fracture was due to a punctured wound of the foot. The animal was treated and operated only ten days after the injury was received. After partial removal of the sole and entire extirpation of the frog, the operator made on a level with the fistula that existed, a large incision, infundibuliform in shape, which arrived to the aponeurotic expansion of the deep flexor of the phalanges, which had itself been perforated by the street nail, in its anterior part. The probe then, introduced in the wound, revealed that the navicular bone was rough and movable. Exposed by removal of tissues covering it, it appeared completely fractured on a level with its internal extremity. A drain was applied, passing by the hollow of the coronet region and after irrigation of the wound a simple compressive dressing was applied. After-treatment consisted in daily antiseptic irrigation.

About a month and half after the operation, cicatrization was complete and, radically cured, the animal resumed work.—(*Il Nuovo Ercolain.*)

“SECRETARY’S OFFICE OF THE PERMANENT COMMITTEE FOR THE INTERNATIONAL VETERINARY CONGRESSES AT THE HAGUE, STATIONSWEG 74 (INT. TEL. 848).” (Under patronage of the Dutch Dept. of Agriculture, Industry and Commerce).—Correspondence, printings, etc., as far as they are not sent to the President of the Committee, the Privy Counsellor Dr. A. Lydtin at Baden-Baden, or to the Secretary Prof. Dr. D. A. De Jong at Leyden, are immediately to be addressed to the Secretary’s office mentioned before.

BARNYARD SANITATION is the title of the subject treated in *Extension Bulletin No. 44, Minnesota Farmers’ Library*, by Dr. H. Preston Hoskins, assistant veterinarian, University Farm, St. Paul, Minn. A very valuable little bulletin of 16 pages, dealing with the principal contagious diseases and the prevention of their spreading, etc., in his characteristic, interesting accuracy, yet concise manner, which must be of inestimable value to stock raisers of the State of Minnesota.

CORRESPONDENCE.

ADELAIDE, SOUTH AUSTRALIA, December 12, 1913.

Editor AMERICAN VETERINARY REVIEW:

SIR—Having received many kind messages from veterinarians in the United States of America conveying their hearty congratulations for my article on "Epizootic Abortion of Dairy Cattle," published in the September, 1913, number of the AMERICAN VETERINARY REVIEW, which I appreciate very much, many of the correspondents—especially those engaged in a cattle practice—have asked for further particulars in the treatment on the lines suggested. I shall be pleased if you can grant me space in your journal to publish the answers to the leading questions.

In acknowledging the numerous communications I have received in reference to my article on "*Epizootic Abortion in the Dairy Herd*," I can assure my correspondents that it will be a duty and pleasure for me to supply, as far as my ability will enable me, all the information which has been asked for.

The lines of treatment suggested in my article are only suitable for extensive outbreaks of epizootic abortion in dairy herds and are too expensive for single cases on dairy farms.

In reference to the leading questions, the following are my suggestions:

- I. "I have always removed the placenta mechanically, but if you have a better way, should like to know."

For eight (8) years I was engaged single-handed in one of the largest cattle practices in the world, and certainly the largest in Australia. These were my methods:

- I. If the case was only a short distance from my headquarters, after removing the foetus, the uterus was irrigated with a bucketful of warm water (about 100° F.), to which was added a small quantity of tincture of iodine. A large funnel and six (6) feet of $\frac{3}{4}$ -inch rubber hose (a necessary part of the outfit required in a cattle practice, *See Post*) are used in making this form of irrigation. The addition of the iodine has a twofold

object: (1) It is a good antiseptic; (2) it prevents the cow eating the placenta, thereby removing all doubt that the after-birth has been expelled. There is no argument that a cow should not be allowed to eat the normal placenta; it is natural for them to do so; when eaten it acts on the system as a purgative. A dairy man having a herd of over one hundred (100) cows cannot afford the time to note if the newly calved cow has expelled the placenta or not. In cases a long distance from headquarters the after-birth should be removed after the delivery of the foetus; this obviates all risk of having to make a second visit to the recently calved cow.

2. "How long after parturition do you use the irrigation for retained placenta?"

In the summer one (1) day. In the winter two (2) to three (3) days.

3. "How often do you irrigate to remove a retained placenta?"

In such cases I fill the uterus with a hot aqueous solution of one (1) per cent. carbonate of soda, commercial, *i. e.*, washing soda. This loosens up the membranes, and by its weight causes the cow to exert an expulsive effort to expel the contents of the uterus. In the majority of such cases all the membranes come away at once; provided there is no decomposition of the placenta, no further treatment is required. Should the membranes be retained after such an irrigation of the uterine cavity, it is to be anticipated that they are retained through being wound round the maternal cotyledons, or adherent to the walls of the uterus. The correct procedure in such cases is to remove the retained placenta by mechanical means, bearing in mind that the first principles are—the maternal cotyledons must not be injured, thereby preventing any absorption of septic conditions which may accompany such cases. In the removal of the placenta from the uterine walls, the fingers and short finger-nails only should be used; no surgical instruments are admissible; should the membranes be wound around the maternal cotyledons great care should be exercised, and they should be removed in the manner which one exerts in undoing a button of a garment. Should there be a septic condition of the contents of the uterus, before their removal liberal irrigation with hot water and iodine should be adopted. After the membranes are removed another flushing is required; if the uterus has lost its tone, *i. e.*, the contents are

not expelled, it is necessary to use the hose as a syphon, and remove all the fluid from the uterine cavity with a clean sponge. If the first manipulation is done in a thorough manner, further exploration is not necessary; flushing with hot water and iodine once a day is all that is required until the uterus is in a normal condition. Under such conditions the following must be remembered:

(1) The long limb of the hose, when using as a syphon, should be filled with solution before the short limb is placed in the uterus.

(2) The hose requires to be guided by the hand when entering the os uteri.

(3) Clean hands and arms are necessary in such manipulation. Although the uterus and the membranes are in a septic condition it is not necessary to add a new strain of micro-organisms by hands and arms which are not clean enough to be beyond suspicion.

(4) Cuts and scratches of the hands and arms should be treated with liniment of iodine; many obstetricians in veterinary practice have regretted not adopting this necessary precaution.

When called in to treat a cow, in my outfit are a six (6) feet length of three-quarter ($\frac{3}{4}$) inch rubber hose; a funnel; a light hardwood mouth gag, with a hole in its middle large enough to pass the hose through, and a blocked saline purge. If the cow requires a purge, the blocked saline purgative powder is added to three-quarters ($\frac{3}{4}$) of a bucket of hot water and well stirred, the mouth gag is fixed in the mouth by means of a strap with buckles on both sides placed behind the horns and ears, while straps over the nose and under the lower jaw keep it in position. The end of the hose is passed through the hole in the gag to the back of the mouth, then gently pushing it into the oesophagus, making sure that it has not entered the trachea—by feeling its passage along the jugular furrow on the left hand side of the neck, then pass into the entrance of the rumen. An eructation of gas will be an indication that the hose has entered the rumen. The hose in position, fix the funnel in the other end, and pour in the contents of the bucket from an elevated position, *i. e.*, by standing on a box. The same hose and funnel can be used for the irrigation of wounds; flushing out the uterus, the administration of rectal injections, as a syphon to remove fluids used in flushing out the uterus, and for irrigating and syphoning medicated solution from the stomach in cases of poisoning.

J. DESMOND.

CHICAGO, ILL., February 7, 1914.

Editor AMERICAN VETERINARY REVIEW:

On page 612 of the February number appears a title pretentious enough to be sure, *Rupture of Stomach of Horse Caused by Blocking the Outlet of Ingesta in Determining Ingestion*. The ordinary, poor, illiterate fellow glancing at that stupendous effort has a fleeting impression that he will read of new physiological research of some interest to him. After brief reading the substance of all the turmoil is that a horse died with a ruptured stomach. The rupture occurred in the great curvature. I have posted only a few cases of ruptured stomach, but when I find one case presenting the rupture in a location other than the great curvature I will be surprised. The fact that at the seat of rupture there were congestion and extravasation of blood simply indicates that the stomach ruptured some time before the animal died; this was the reason he vomited. Further, the statement that the pyloric end of the stomach was filled with bots together with an impaction of bots in the anterior portion of the duodenum is nothing to marvel at. The horse taking sick a short time after the ingestion of fermenting food, green corn fodder, resolves itself to a simple piece of logic. A fermenting condition of the gastric contents and its subsequent dilatation causes displacement of the borders of the stomach beyond their normal boundaries. This causes a stenosis or perhaps a complete closure of some part of the S-shaped curve of the duodenum, which lies on the visceral surface of the liver, the part of the intestine called duodenal trap by Reeks. The bots that are in the stomach at this time, and they are generally in the pyloric end, are forced toward a point of least resistance. They become impacted in the duodenum anterior to the closure or stenosis produced by the extreme dilatation of the stomach and are of secondary consideration in attaching the cause of death; the title has no connection with the case.

W. J. RATIGAN, Chicago Veterinary College '14.

THE bureau employees who will be affected by legislation proposed in H. R. 9292 are engaged in meat inspection, tick and scabies eradication, tuberculin testing of cattle, mallein testing of horses, hog cholera-serum demonstration, and the 28-hour law in the U. S. B. of A. I.

BIBLIOGRAPHY.

MANUAL OF THE PRACTICE OF VETERINARY MEDICINE.

MANUAL OF THE PRACTICE OF VETERINARY MEDICINE, by Edward Courtenay, M.R.C.V.S. Third Edition; Revised by Frederick T. G. Hobday, F.R.C.V.S., F.R.S.E., Honorary Veterinary Surgeon to His Majesty the King; Fellow of the Royal Society of Medicine; Honorary Member of the American Veterinary Medical Association; Membre Correspondant de la Societe de Medicine Veterinaire du Brabant; Late Member of the Examining Board of the Royal College of Veterinary Surgeons, and formerly Professor in the Royal Veterinary College, London. More than 450 pages, with 77 illustrations. London, Balliere, Tindall and Cox, 1913. Price, 10s. 6d. net—\$2.75.

This handsome volume (*"Dedicated to Professor A. Liattard, M.D., V.M. (a Distinguished Graduate of the Alfort (Paris) Veterinary School), Whose Untiring Work for the Profession in America Has Always Had the Admiration and Appreciation of His Colleagues in Great Britain,"*), was recently received at the REVIEW office with an inscription on the fly-leaf by the editor, presenting it to the REVIEW editor, expressive of the donor's friendship and kindest feelings; and its perusal has given us a great deal of pleasure. Its thirty-two chapters embrace *Diseases of the Respiratory System; Respiratory Diseases of the Ox; Stangles; Lymphangitis; Affections of the Skin; Diseases of the Eyes; Diseases of the Nervous System; Inflammation; Diseases of Bone; Wounds; Diseases of the Feet; the Teeth; Injuries, etc., in the Region of the Mouth; Injuries, etc., in the Oesophageal Region; Diseases of the Stomach and Intestines; Diseases of the Liver; Diseases of the Spleen and Pancreas; the Ox; Diseases of the Urinary System; Diseases of the Male Organs of Generation; Glanders and Farcy; Variola; Castration; Diseases of the Female Organs of Generation; Pregnancy, Parturition, and Their Results; Azoturia; Cardiac Diseases; Black-Quarter and Swine Fever; Tuberculosis and Johne's Disease.* The foregoing headings suggest in the briefest possible manner the field covered. It must of necessity be a brief suggestion, since one heading may embrace upwards of twenty dis-

eases of everyday occurrence among domestic animals. Each condition is described in a clear, concise manner, going direct to the point in regard to cause, symptoms, treatment, prevention, etc., with as few words as possible, thus avoiding confusion and holding the reader's interest. Wherever the surgical interferences of everyday practice are indicated, the particular operations, whether they be major or minor, are described. We in America, are fully appreciative of the carefulness and thoroughness of the English veterinary practitioner and enjoy listening to his interesting portrayal of a case or reading his lucid description of a condition, and therefore must find *Courtenay's Veterinary Medicine* of unusual interest and value; especially as Professor Hobday, in this third edition, has intermingled the work of American veterinary surgeons with those of Great Britain, as we observe the names of Blattenberg, Cary, Merillat and Williams amongst his list of references to the literature on roaring, one of the operations that is described in his chapter on *Diseases of the Respiratory System*. It is probably the author's thorough appreciation of the trend of the times towards specialization and his careful avoidance of it, that has enabled him to present the veterinary practitioner and the veterinary student with so excellent a *résumé* on the *practice of veterinary medicine*. Strictly modern, *Hobday's Third Edition of Courtenay's Veterinary Medicine* is filled from cover to cover both in text and illustrations with just the conditions that the general practitioner meets in his daily work and so frequently desires a little light on without wading through pages of irrelevant matter to get it. And for the student, who is getting a full share of detail in the lecture room, it is a great assistance.

The publishers have executed their work with excellent taste; the paper is smooth, the type good and the cuts clear; and the book in cloth binding in dark blue, lettered in gold, makes a nice appearance in the office or library.

WE ASK THE INDULGENCE OF READERS AND CONTRIBUTORS. —This being the index number to Volume XLIV, more demand is made on our already crowded number, which will make it necessary for us to withhold a number of excellent articles, several of them already in type; and we ask the further indulgence of our readers, and of the authors of the articles, assuring both sides that they will all appear if they will have patience with us, as we feel sure they will.

ARMY VETERINARY DEPARTMENT.

"NOW FOR A VETERINARY"—A DIATRIBE ON MAJOR GENERAL LEONARD WOOD.

Under the caption, "Now for a Veterinary," the *Chicago Daily Journal*, on its editorial page February 2d, prints a vile diatribe on no less a person than the highest officer of the military establishment, Major General Leonard Wood, Chief of Staff of the Army. We would let it pass as beneath our notice, vulgar, bungling, semi-satirical as it is, were it not for certain coincidences noticeable and under-currents of suggestiveness betrayed in the article which reveal the face behind the mask of the writer of it.

This is the article:

"NOW FOR A VETERINARY.

"When the detail of Gen. Wood, M.D., as Chief of Staff of the United States Army expires next April, why would it not be a good plan for Secretary Garrison to extend the Roosevelt precedent and appoint a veterinary surgeon to this important post?

The *Journal* believes that this suggestion should receive thoughtful, not to say prayerful attention from the war department. It would fill a long-felt want, as ad writers used to say. Everyone admits that General Wood, M.D., is a "perfect saint for a liver complaint"; but think how he would have been handicapped in dealing with such military emergencies as glanders and farcy! Imagine his distress in the presence of an invasion of ringbone, his helplessness before a flank movement of spavin or bots!

"There be old fogies who insist that when General Wood retires the post of Chief of Staff should be given to some first-class soldier, some trained, professional fighter from West Point, who can organize our land forces in time of peace and lead them in case of war. The *Journal* trusts that such back-number notions will not prevail. We could capture an invading army with ice-cream freezers—Andrew Carnegie says so, and surely he is an expert in martial affairs. What is needed is a chief who can

keep our soldiers from getting the heaves, and will know what to do if the men in khaki eat too much alfalfa.

"Exit General Wood, M.D., and hooray for General John Doe, veterinary surgeon, and Chief of Staff of the Army of the United States!"

It is a remarkable coincidence, is it not, that this editorial should appear on the very day that the Army Veterinary Service Bill, H. R. 4541, unanimously passed the House Military Committee? It is not often that there is spread upon the editorial page of a great metropolitan daily an article referring in a guised, indirect way, as this seems to do, to the veterinarians in the army. But when a vile diatribe appears on an equally dignified and noted military character like General Wood, at the very time that legislation is pending for the veterinarians for the army, and in which mud is thrown at his record and screams of laughter is expected to be provoked by suggesting that he be succeeded in the post of Chief of Staff by a "veterinary," it is perfectly obvious that the masked hand of the man who wrote the article, or indicated that it might be written, was that of a man who knew something more about the Army than appears on the surface of this article.

There is no love for the democratic party to be found in the hearts of most of the men of the Army now in high rank or in high command. There are two excellent reasons for this as the average military person sees them: First, the present government is against expansion of the Army and its policy is to abbreviate rather than enlarge its power; second, it has tended to squelch the promiscuous attempts on the part of many persons in the Army opposite in political faith to the party in power to form public opinion in favor of such expansion, which to the present government means increasing the burdens of the public, that is, is against the policy of economy. Consequently this class of Army men has taken, more than ever, to influencing the public mind through the press either through anonymous contributions or else by suggesting topics for anonymous contributions.

The fact seems to be that the slur in this editorial, as far as we are concerned, is less upon General Wood than it is upon the veterinary profession of America. The article is written in Bowery English and its thought is murky as the Bowery mind. It is, as it were, a street urchin criticising a person so remote from his ken of thought as this military dignitary—General Wood—must be. Shakespeare has written in *Twelfth Night*, "Even a cat may look at a king," and it might be added that even

a dog might criticise one. It seems manifest that the person who suggested the writing of this editorial had read his *Army and Navy Journal* this year or two and knew something about the legislation pending for veterinarians in the Army, perhaps knew the attitude of General Wood towards that legislation. The suggestor was probably a line officer who hated General Wood, a physician who had risen by sheer merit to be head of the Army, and he was also a man jealous of the Army medical corps and the power it wields in the military establishment. Besides the editorial is a slur on our honorable profession, which aspires to nothing in the army but justice to itself. The sling at the veterinary profession in the editorial is of the same kind as the sling of the deposed Speaker Cannon, who, at the time the Army Veterinary Bill went through on the floor of the House in the 62d Congress by unanimous consent, January 6, 1913, rose with the object of making the profession the butt of laughter and said, "Do they want to be major-generals?"

GARRISON STEELE, M.D., D.V.M.

THE HORSE DOCTOR AND THE MAN DOCTOR.

In the memorandum of the late Surgeon-General Torney to the Chief of Staff, U. S. Army, in which he recommends that the veterinary service be established as a corps and attached to the Medical Department, appears some interesting statements.

At the outset the general says: "Veterinary medicine is a learned profession, with a voluminous periodical and permanent literature of its own. For *efficiency, there is the same necessity that the horse doctor should be learned as for the man doctor, etc.*" The latter sentence has provoked the displeasure of a few oversensitive colleagues. I cannot help but think that it is one of the cleverest expressions yet heard. It restores this old, pure-English term to its proper meaning; it apprises the laity of its true significance; it satisfies the pride of the veterinarian and also makes the surgeon, as the man doctor, feel his relationship towards us in the light of a broad comparison. It took a man of ripe learning, of real wisdom, to coin such a paraphrase at a moment when bigoted officials were apt to smile with derision at the endeavors of the veterinary profession to raise itself to a more dignified standing in our army, using, no doubt as they did, this time-honored term in contempt.

Looking back a short time only, there was some alarm when

it became known that the veterinary service would be attached to the medical service of the army. Anything new, out of the order of old routine ways, seems always to disturb the equilibrium of the ultraconservative. Happily, sober second thoughts have changed doubts into acquiescence with this proposition. We realize that it will take time for both parties to the deal to find their proper relationship. For one thing, we never had a connection with our friends, the "medicos," except in a jocular way, yet we always were on fair terms with them privately. It is certain that as far as our official affairs in the army will go, we shall have to adjust ourselves to a greatly changed situation. But changes were apt to occur in disposing of our bill in Congress, and it was known for some time past that the tendency was to attach the veterinary service to one or another large department. Policies are changeable, but those who are responsible for their making generally act upon the impulse of what is best for the general good of the service. It would be imprudent for us to buck at the inevitable change, small as it is, immaterial as it ought to be, as long as we gain the coveted price, which we should steadily keep before us, irrespective of little side issues that may come and go.

Finally, as ever, history repeats itself. While it is hardly known to the War Department, yet it is a fact that in a number of smaller European armies the veterinary corps is a part of the medical department. In the Swedish army, for instance, there are only 32 veterinary officers and 92 medical officers, and both have worked together in the "sanitary service" of their army since its incipency, more than one hundred years ago. The Swedish army veterinarian stands well towards the top of efficiency, if compared with his colleagues of the other European armies, and enjoys the enviable record as being the only one who actually is in charge of the remount depot and of the government stud. This ought to be looked upon as good omen for our future record of efficiency and general usefulness in our own army.

O. S.

Dr. C. C. Middleton, Bureau of Agriculture, Manila, P. I., has removed to Collirene, Alabama.

Dr. E. V. Hover, of Delphos, Ohio, has taken up the practice of the late Dr. Gehres, at Convoy, that state.

OBITUARY.

ANDREW M. JANSEN, D.V.M.

Dr. Andrew M. Jansen died in the Protestant Hospital, Columbus, Ohio, on January 4, 1914, after an illness of 22 days, as a result of glanders infection. He graduated from the veterinary school of the Ohio State University in 1910, and was assistant in the bacteriological laboratory of that institution at the time of his death. He was a member of Alpha Chapter, of the Alpha Psi Fraternity. He is survived by a widow and both his parents.

MARTIN GEHRES, D.V.M.

Dr. Martin Gehres, Convoy, Ohio, died on January 12, 1914, by being struck by a fast freight train while returning from a call in the country. He was killed instantly. Dr. Gehres graduated from the veterinary department of Ohio State University, class of 1910, and in less than four years had built up a large practice. He is survived by a wife and one son.

CHARLES H. MCGILLICUDDY, V.S.

Dr. Charles H. McGillicuddy, of Bath, Maine, died Saturday morning, January 24, 1914. He was 48 years, 3 months and 2 days old. He was born in Lewiston, Maine, and received his early education in that city. Dr. McGillicuddy graduated from the Toronto Veterinary College in 1896. After graduation he went to Bath, where he has been in practice ever since. The doctor is survived by a wife and daughter 18 years old.

The funeral services at his residence were attended by many relatives and friends. The services were conducted by the Rev. H. A. Corey, of the Wesley M. E. Church, and the pall bearers were Dr. George F. Wescott, of Portland; Dr. Chester L. Blakely, of Augusta; Dr. Carr W. Watson, of Brunswick, and Dr. George R. Inglis, of Auburn, members of the Maine Veterinary Medical Association. Dr. William H. Lynch, of Portland, was also present. There were many beautiful floral tributes, including large floral pieces from the Maine Veterinary Medical Association, Bath Aerie F. O. E. and Congressman D. J. McGillicuddy, of Lewiston, a cousin of the deceased. Interment was in Oak Grove Cemetery.

SOCIETY MEETINGS.

MISSOURI VALLEY VETERINARY ASSOCIATION.

RESUME OF THE KANSAS CITY MEETING IN JANUARY.

A new record was made by the Missouri Valley Veterinary Association in its midwinter meeting at Kansas City, Mo., January 27, 28 and 29, from the viewpoint both of attendance (there being 350 veterinarians present) and of keen interest in the proceedings. The meeting room was fully occupied during the two days' session at the Coates House, Tuesday and Wednesday, and no standing room could be had during the all-day clinic at the Kansas City Veterinary College on Thursday. Visiting laymen remarked upon the keen interest displayed in the program by those in attendance.

The first day was devoted to discussions of medicinal agents and food poisoning, there being several good papers in each division. "Fifteen Years of Observation," by Dr. L. L. Cross, of Clinton, Mo., developed a number of interesting practical points from the position of an experienced practitioner. A treatise on "Quinine," by Dr. Geo. Judisch, of Ames, Iowa, was very instructive and well rendered. Dr. H. Jensen, of Kansas City, offered his usual goodly store of information relative to medication, confining his remarks chiefly to the methods of administration. Dr. D. O. Knisely, of Topeka, Kans., reported a number of interesting tetanus cases.

The evening session on Tuesday was given over to food poisoning and practically every phase of the subject was discussed. A paper by Dr. R. P. Poage, of Shelbina, Mo., carried the thought that some of the toxic effect from food stuffs were due to acidity because of insufficient alkaline salts. He based his statement upon his observations that most of the trouble in his locality is found in localities where the soil is deficient in alkaline salts. As a prophylaxis, Dr. Poage recommended feeding lime salts with the faulty food stuffs, especially ensilage.

"Silage Poisoning" was the subject of a paper by Dr. D. B. Morgan, of Neosho, Mo., and he blamed much of the ill-effect of

silage to the improper method of curing and storing the food stuff. The thought was brought out that silos are practically a new idea and that much must be learned concerning the use of them before highest efficiency can be secured and dangers to the animal overcome.

Dr. T. T. Christian, of Texarkana, Texas, offered a paper on cotton seed meal poisoning, which drew lively interest from the southern veterinarians. A great deal of attention is being given to this important food stuff in the South, and recently some progress has been made in the attempt to overcome the ill-effects of the food fattening stock.

All day Wednesday was devoted to the discussion of anti-hog cholera serum. The following papers were offered: "*Slaughter Rather Than Tail Bleeding in Manufacture of Potent Serum*," G. A. Johnson, Sioux City, Iowa; "*Hog-Cholera Serum Manufacture*," illustrated by lantern slides, Herbert F. Palmer, Philadelphia, Pa.; "*What Is a Reasonable Percentage of Abscesses When Properly Done?*" F. M. Caldwell, St. Joseph, Mo.; "*The Dependability of Commercial and State Virus*," F. H. Hueben, Kansas City, Kans.; "*The Dependability of Commercial and State Serum*," D. W. McAhren, Des Moines, Iowa; "*Is It Necessary to Take Temperatures in Supposedly Healthy Herds? When Is Serum Alone Indicated?*" J. H. Oesterhaus, Kansas City, Mo.; "*Effect of Serum-Virus on Pregnant Sows, on Pigs, on Sows with Suckling Pigs*," C. J. Sihler, Kansas City, Kans.; "*Maximum and Minimum Dose of Virus and Its Effect on Duration of Immunity*," G. I. Blanchard, Kansas City, Kans.; "*What Is a Just Charge for the Administration of Serum and Virus?*" B. A. Robinson, Kansas, E. A. Shikles, Missouri, Henry Hell, Iowa; "*Care of Herd After Treatment, Especially Feeding*," P. Juckniess, Omaha, Nebr.; "*The Place of Anti-Hog-Cholera Serum in the Control of Hog Cholera*," M. Dorset, Washington, D. C.; "*Preventive Measures Other Than Vaccination in Combating Hog Cholera*," J. W. Connaway, Columbia, Mo.

Dr. Caldwell favored the injection of serum into the subscapular region, as he contended abscesses were less likely to form in that region. He contended the percentage of abscesses should not exceed one-half of one per cent.

Both papers relative to the dependability of state and commercial serum were interesting and carried out the thoughts that state serum should at least be as good as commercial serum, as the state had the advantage in equipment and finance; and that laws applying to one should apply to the other.

Dr. Sihler suggested the economy in giving simultaneous treatment to pigs at the age of about three months, thus reducing expense of losses and cost of serum.

The discussion of charges for administering serum drew a wide range of opinion. In substance it was agreed that mileage and a reasonable charge for service is justifiable, circumstances making it difficult to fix a definite charge.

Dr. Connaway advocated serum-alone treatment and rigid quarantine as the only sure means of controlling cholera. This theory is being tried out by the federal government at the present time.

The chief paper of the day was that of M. Dorset, upon "The Place of Anti-Hog-Cholera Serum in the Control of Hog Cholera." In reality his treatise was a preliminary report of the findings of the Bureau in its experiments with serum in Dallas County, Iowa; Montgomery County, Ind., and Pettis County, Mo.

Dr. Dorset, in outlining the plan of experiments being made by the government, stated that in addition to the use of serum, rigid quarantine and an active educative program are being employed. As the work was started in July, after the cholera infection was wide-spread, lack of men and serum prevented complete fulfilment of the plan; hence the results are not as certain as they might otherwise be.

The sources of infection, as shown by the chart made by Dr. Dorset, were somewhat surprising. By far the greatest percentage of infection came from persons and the next largest from birds. The chart showed that 45 per cent. of the infection came through agents which it would be very difficult to control; for instance, birds, wind and flowing water.

In conclusion Dr. Dorset offered the following suggestions:

"I have now described to you the plan followed by the Bureau of Animal Industry in attempting to control hog cholera; I have, furthermore, presented a summary of certain features of this work. In concluding, I wish to once again emphasize the importance of education and sanitation in the control of hog cholera. Consider hog cholera in connection with smallpox and diphtheria in man. We have for smallpox a reliable vaccine and for diphtheria a potent serum. Yet we find that the best medical authorities the world over insist upon the enforcement of rigid quarantine against all cases of smallpox and diphtheria, and they do not depend upon the immunizing agent alone. If this is neces-

sary in the case of these two human diseases, it is certainly necessary in the case of hog cholera.

"We should endeavor through education of the farmer concerning the nature of hog cholera and the ways in which it is spread, to limit the number of outbreaks. We should further, by the enforcement of sanitary regulations and quarantine, endeavor to confine the disease to its original center.

"The anti-hog-cholera serum either injected alone or according to the simultaneous method should be used to save hogs in herds that become infected notwithstanding our sanitary and educational measures, and also to prevent the disease in animals which are so clearly exposed that reliance cannot safely be placed upon quarantine pure and simple.

"I believe that no campaign against hog cholera in this country can be successful unless we employ the anti-hog-cholera serum, and likewise I believe that the anti-hog-cholera serum alone without the enforcement of proper quarantine laws and without the co-operation of farmers secured through education will surely fail of success."

On Wednesday evening a banquet was held at the Coates House and following the service Dr. John S. Barbee, food inspector of Kansas City, offered a resume of the progress of food inspection and some suggestions for more uniform regulations. Following his talk he answered any questions relative to inspection which the guests cared to ask.

Thursday was devoted to clinic in the Amphitheatre of the Kansas City Veterinary College. The following cases were presented:

A cryptorchid with complications, operated upon by Dr. L. D. Brown, of Guthrie, Okla.

A cryptorchid, operated upon by Dr. L. U. Shipley, of Sheldon, Iowa.

A non-infective post-operative tendinitis, Dr. S. S. Dykstra, of Manhattan, Kans., and Dr. G. H. Roberts, of Indianapolis, Ind., clinicians.

An open perforans tendon sheath, as a result of nail puncture, Dr. G. H. Roberts, of Indianapolis, clinician.

A demonstration of wound suturing, by Dr. L. A. Merillat, of Chicago.

A case of chronic necrosis of perialveolar tissue and extraction of third lower molar, Dr. J. H. Slater, of Richmond, Mo., operating.

A liberal discourse on the conditions present, and a discussion of various procedures which could be adopted, with the operator's reasons for one selected in each case, made the clinic of more than passing value. A series of questions concerning the cases and operations presented by members present and answered by the clinicians added to this instructive feature of the meeting.

S. S.

TENTH INTERNATIONAL VETERINARY CONGRESS, LONDON.

The Tenth International Veterinary Congress will be held in London from the 3d to the 8th of August, 1914.

This is the jubilee congress, and it is being held in London by the express desire of the veterinarians of the world in honor of a distinguished English veterinarian, John Gamgee, at whose suggestion international veterinary congresses were first instituted.

Although it is not customary for British governments to finance international congresses of any description, the British government is taking a great interest in the coming congress, and invitations in the following form have been issued by the British Foreign Office to the various countries, inviting them to send official delegates:

(Copy.)

FOREIGN OFFICE,
September, 1913.

HIS MAJESTY'S REPRESENTATIVES
Abroad.

SIR—I transmit to you herewith copies of the programme of the Tenth International Veterinary Congress, which it is proposed to hold in London from August 3d to 8th, next year, with the request that you will communicate it to the Government to which you are accredited, inviting them at the same time to send delegates thereto.

The history of these congresses is as follows:

Forty-nine years ago, at the suggestion of a distinguished British veterinarian, John Gamgee, the first International Veterinary Congress was held. Gamgee's suggestion was put forward on account of cattle plague, which had traveled from Russia practically all over Europe, devastating the herds, and he recognized that the control of animal plagues could not depend entirely upon each country itself, but must be the common care of all. The wisdom of Gamgee's suggestion was immediately recognized by all the European countries. These congresses inter alia discuss all international questions in relation to animal plagues.

Arrangements could not, unfortunately, be made to hold the first or any of the other congresses in Great Britain, but they have been by arrangement held every five years in various capitals of Europe. The governments of the

various countries concerned have always issued invitations to other governments to send delegates.

The ninth congress was held at the Hague in 1909, and on that occasion the governments of Argentina, Austria (including Bohemia, Croatia and Slavonia), Bavaria, Belgium, Bulgaria, Colombia, Cuba, Denmark, Germany (including Saxe-Weimar), France (including Algeria and Tunis), Greece, Guatemala, Hungary, Italy, Japan, Luxemburg, Mexico, Norway, Netherlands, Roumania, Russia, Saxony, Servia, Sweden, Switzerland, United States of America, Uruguay and Wurtemberg were represented, as well as Great Britain and certain of the British oversea dominions.

Although the congress is not promoted by His Majesty's Government, they take a great interest in the objects for which it is being summoned, and would learn with pleasure that the invitation had been accepted. They would also view with satisfaction the separate representation at the congress of such educational, scientific or other bodies in foreign countries as are interested in promoting the veterinary and kindred sciences.

The British Committee of Organization extend a hearty invitation to their foreign colleagues in every country, and they desire to inform visitors to the congress from abroad that it will be more convenient if they try to arrive in London on Saturday, the 1st of August. It is the intention of the British committee to hold a preliminary reception on the evening of Sunday, the 2d of August, to enable members to meet each other, to discuss the arrangements for the official opening of the congress, and to obtain any further information regarding the arrangements they may desire.

The official opening will take place on Monday, the 3d of August, 1914, when the committee hope to secure the patronage of an exalted personage to open the congress, but arrangements with regard to this matter have not yet been completed.

PLACE OF MEETING.—The meetings of the congress will be held at Central Buildings, Westminster, London, which offer exceptional facilities for the purpose.

The place of meeting is close to the Houses of Parliament, and the position is exceptionally convenient in relation to hotels, restaurants and amusements.

ENTERTAINMENTS.—The Foreign Office has consented to give an entertainment in honor of the congress. The arrangements for the other banquets and receptions which will be given in honor of the congress have not yet been completed, but full particulars will be circulated to the national committees for publication at as early a date as possible.

The British committee are also organizing excursions of the following description:

(1) Visits to noted herds and studs within easy reach of London. They have already been informed that permission will be granted to visit the royal herds at Windsor.

(2) Visits to the quarantine and research stations of the Board of Agriculture.

(3) Excursions after the congress to places of historical interest and places noted for beautiful scenery.

In designing the itineraries due regard will be paid to the wishes of those who may desire to combine pleasure with instruction by visiting districts in which there are noted studs, herds and flocks.

TRAVELING.—The committee are trying to arrange with various railway and steamship companies in Great Britain and abroad to allow special concessions to those attending the congress, and they have thought it advisable to seek the advice of Messrs. Thos. Cook and Son, who have undertaken to give every assistance and to provide interpreters at the various railway stations on Saturday, the 1st of August, for the convenience of those arriving from abroad who are not well acquainted with London.

These arrangements will form the subject of a further publication when they are completed.

HOTEL ACCOMMODATION.—There is an enormous number of good hotels and restaurants within a stone's throw, as it were, of the meeting place. Hotels and restaurants in London are excellent, and the tariffs are very moderate. The tariff in good hotels varies from 5s. upwards for a single room, bath and English breakfast. Visitors who do not desire to take pension will have no difficulty in obtaining rooms in first-class hotels at prices from 5s.

It is not possible in this article to furnish a complete list of good hotels which are situated conveniently for the place of meeting. A full list, however, together with their tariffs and approximate distance from the place of meeting, will form the subject of another publication when the arrangements with the various proprietors have been completed.

SUBSCRIPTION OF MEMBERSHIP.—The British committee have fixed the amount of the subscription for ordinary members at one pound = 5 dollars = 20 marks = 25 francs. The subscription for lady members has been fixed at five shillings = 1 dollar and 25 cents = 5 marks = 6 francs 25 centimes.

Subscriptions should be sent to the Honorary Treasurer, Mr. F. W. Garnett, J.P., M.R.C.V.S., 10 Red Lion square, London, W. C. It has been suggested by several of the national committees that the various secretaries of these committees might collect subscriptions in their own countries and forward them in bulk. The honorary treasurer desires it to be known that while

he thinks it would be simpler for the purpose of accounting that each individual should send his own subscription, he has no objection to the subscriptions being sent in bulk, provided full details in connection with each subscription are furnished by the secretary of each national committee.

SUBJECTS FOR DISCUSSION.—The following is a list of the subjects which will be discussed:

GENERAL MEETINGS: *Foot and Mouth Disease; Tuberculosis; Epizootic Abortion; Public Control of the Distribution and Sale of Milk in the Interests of Public Health.*

Section I. VETERINARY SCIENCE IN RELATION TO PUBLIC HEALTH: *Meat Poisoning—Its Pathogenesis and the Measures Necessary to Guard Against It; General Principles to Be Observed in the Inspection of Carcasses and Organs of Tuberculous Animals, with a View to Determine Their Safety as Articles of Human Food; Disinfection of Wagons.*

Section II. PATHOLOGY AND BACTERIOLOGY: *Johne's Disease; Bovine Piroplasmoses (European); Ultra-Visible Viruses; Distemper—Etiology and Vaccination.*

Section III. EPIZOOTIOLOGY: *Anthrax; Swine Fever; Glanders; Sarcoptic Mange of the Horse.*

Section IV. VETERINARY MEDICINE AND SURGERY: *Anaesthesia; Laminitis; Surgical Treatment of Roaring; The Use of Drugs in the Treatment of Disease Caused by Nematode Worms.*

Section V. TROPICAL DISEASES: *Diseases Transmitted by Ticks; Their Classification, Treatment and Prevention; Diseases Transmitted by Winged Insects; Their Classification, Treatment and Prevention.*

MAINE VETERINARY MEDICAL ASSOCIATION

The quarterly meeting of the M. V. M. A. was held in Portland at the New Chase House January 14, 1914. The meeting was called to order at 3.30 p. m. by the president, Dr. Jervis.

The following responded to the roll call: Drs. W. H. Corey, C. F. Davis, C. F. Dwinal, J. B. Darling, H. N. Eames, R. E. Freeman, E. E. Gibbs, F. W. Huntington, G. R. Inglis, H. B. F. Jervis, A. Joly, W. R. Jackson, W. S. Lord, W. H. Lynch, A. L. Murch, C. H. Newton, J. L. Parks, C. W. Purcell, E. E. Russell, I. L. Salley, W. H. Spear, H. L. Stevens, C. L. Ryan, W. H. Robinson, H. B. Westcott, W. L. West.

The following were welcome visitors: Dr. H. S. Irish, of

Westbrook, Me.; Dr. E. V. Estes, of Portland, Me.; and Dr. A. D. Howden, of Presque Isle, Me.

The minutes of the October meeting were read and accepted.

The committee on the revisal of the schedule of fees, consisting of Drs. West, Eames and Lynch, reported they had a report drawn up. Dr. Lynch read the report of the committee. This report brought forth a good discussion. Dr. Purcell made a motion that the report be laid on the table, but this motion was lost. After much discussion the report was adopted and passed with two amendments.

Dr. Robinson moved that the business be suspended, so that the election of officers might take place. This motion was seconded and carried.

Dr. Purcell nominated Dr. H. B. F. Jervis for president and Dr. Robinson seconded the nomination, and as there were no other nominations Dr. Jervis was declared elected to another term.

Dr. Robinson's motion that the vice-president, treasurer and secretary be renominated for a second term, which is customary, was seconded and carried. The secretary was instructed to cast the vote of the association for the nominees. The secretary cast the ballot and declared Dr. C. W. Purcell re-elected vice-president, Dr. I. L. Salley treasurer, and Dr. H. B. Westcott secretary.

The executive committee reported favorably on the applications of Dr. A. D. Howden, of Presque Isle, Me.; Dr. E. V. Estes, of Portland, Me., and Dr. F. W. Boland, of Kittery, Me. The ballot was cast in favor of these gentlemen, and they were declared members of the association.

Dr. W. L. West, secretary of the State Board of Veterinary Examiners, gave a very interesting talk on the work the board is doing and outlined the policy of the board. Dr. West said that most of the other state boards were willing to reciprocate with the Maine board. The association extended Dr. West a vote of thanks for his valuable remarks.

Dr. C. F. Dwinal read a very interesting paper on "Dystokia" and a few cases met with in general practice. This paper was discussed freely.

Letters of appreciation of the honor bestowed upon them by the association by their election to honorary membership were received from Dr. H. F. Palmer, of Philadelphia, Pa., and Dr. W. M. Simpson, of Malden, Mass. It was voted that the letters be received and placed on file.

The executive committee audited the books of the secretary

and found them correct. It was voted to hold the next meeting at Bangor, April 8, 1914. The meeting adjourned at 6 p. m.

The ladies attended a matinee at the Jefferson Theatre in the afternoon.

At 7 p. m. a banquet was served in the American Room of the New Chase House. The following were seated at the tables: Dr. and Mrs. W. H. Robinson, Dr. and Mrs. W. S. Lord, Dr. and Mrs. W. H. Lynch, Miss Eleanor S. Moody, Dr. H. B. F. Jervis, Dr. A. Joly, Mrs. G. F. Wescott, Dr. H. B. Wescott, Dr. and Mrs. W. H. Spear, Miss D. Parlin, Dr. C. F. Davis, Dr. H. S. Irish, Dr. H. N. Eames, Dr. J. L. Parks, Dr. H. L. Stevens, Dr. C. H. Newton, Dr. E. E. Russell, Dr. C. L. Ryan, Dr. E. V. Estes, Dr. F. W. Huntington, Dr. W. L. West, Dr. C. F. Dwinal, Dr. I. L. Salley, Dr. W. H. Corey, Dr. W. R. Jackson, Dr. A. D. Howden, Dr. J. B. Darling, Dr. R. E. Freeman.

Dr. F. E. Carmicheal, chairman of the Portland Board of Health, gave a very interesting talk on the work the board is doing in cleaning up the city milk supply and thanked the veterinarians for the able assistance they have given the board. After the remarks of Dr. Carmicheal all present adjourned to the parlors where there was an orchestra and dancing, and a social time was spent until a late hour. This first ladies' night was declared a success, and all present hoped it would be made an annual affair.

H. B. WESCOTT, Secretary.

THE WISCONSIN STATE VETERINARY SOCIETY.

The above society held its third semi-annual convention and banquet at Sheboygan August 19, 20, 1913, having the following program: "Opening Address," Pres. J. T. Hershheim; "Address of Welcome," Mayor Dickmann, of Sheboygan, who in few and selected words welcomed the society to his city and gave an interesting history of the city, stating that the "Four C's" explained or signified the things that Sheboygan was noted for, viz.: Children, churches, cheese and chairs. Papers presented: *Municipal Milk and Meat Inspection*—Dr. S. L. Pilgrim, city meat and dairy inspector of Milwaukee; *Surgical Relief for Contortion of the Uterus in the Cow*—A. H. Hartwig, Watertown; *The Good of the Profession*—Dr. H. P. Clute, Mil-

waukee; *Dairy Inspection*—Dr. G. Ed. Leech, Winona, Minn.; *The Hog Cholera Problem in Wisconsin* (Discussion).

Detailed report of experiment with anti-abortion serum (Mulford's) on twenty-four head of cattle conducted at the clinics of the last semi-annual convention. The following report was given: "Out of twenty-four cows which had aborted the previous year, two again aborted, one of which was slaughtered and the other received a second treatment with the serum and carried her calf the normal period of gestation."

Each paper and subject on the program was followed by lively discussions.

The following veterinarians applied for membership and were elected: Dr. Edward Boessewetter, Dr. B. H. Segoe, Dr. E. L. Morgenroth, Dr. Jas. O'Donnell, Dr. H. L. Eddy, Dr. A. C. Stoltzmann and Dr. A. J. Matthias. Dr. A. H. Baker and Dr. L. A. Merillat, of Chicago, were elected honorary members of the association.

Dr. L. C. Tasche, of Sheboygan, was elected vice-president, the chair formerly held by Dr. J. S. Atkinson, of Marinette, whose death caused the vacancy. Dr. Atkinson was one of the charter members of the society and signers of the articles of corporation. His support and aid toward the advancement of the veterinary profession will never be forgotten.

At seven o'clock the members of the convention gathered around the banquet table at the Hotel Foeste, spread with tasty viands. Dr. G. Ed. Leech acted as toastmaster, calling upon most members for remarks, making it an enjoyable evening of business, music and merriment. Dr. A. H. Baker, of Chicago, was one of the distinguished guests present.

The meeting adjourned shortly before midnight to continue the program and clinic the following day.

The clinic was in charge of Dr. L. A. Merillat, of Chicago, who performed several major operations. Dr. Merillat's demonstrations and skill as a surgical operator were greatly appreciated by everyone present.

Dairy stock judging brought out very interesting methods and valuable discussions.

Dairy hygiene was further discussed at the farm with practical dairy buildings, and cattle for discussion and inspection.

The meeting adjourned at 1 p. m. with an expression from every veterinarian present that the meeting was one of the most instructive, pleasant, business-like meetings ever held in Wisconsin.

W. W. ARZBERGER, Secretary.

NOTES ON THE MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

The Minnesota State Veterinary Medical Association held its annual meeting at the Merchants' Hotel, St. Paul, January 14, 15, 16, 1914.

The meeting was largely attended and was a model of how valuable and interesting such an association can be.

After the dispatch of routine business President M. R. Higbee, of Albert Lea, gave a very interesting report of the clinics held at the summer meeting, describing briefly the cases, method of operating and the after-results of the operations. This was very valuable, as at most clinics the results of the operations are known to but few.

The first evening meeting was devoted entirely to a discussion of "*Hog Cholera and Methods of Control.*" This is a very important part of the veterinary practice in Minnesota, and a lively discussion followed, which brought out many practical points.

Thursday morning Dr. F. E. Palmer read an excellent paper on the "*Management of the Breeding Stallion.*" which brought out the close relationship between the veterinarians and horse breeders of Minnesota. Dr. W. Lewis read an excellent paper on "*Standardizing Disinfectants.*" and urged some federal regulation that should compel the manufacturers to indicate the strength of the disinfecting solutions sold. A paper on "*Internal Antiseptics*" was read by Dr. N. S. Mayo. Dr. C. C. Lyford gave an exceedingly practical talk on "*Herniac of Various Kinds.*" Dr. Lyford's long and varied experience as a practitioner enabled him to speak as an expert. For scrotal hernias in young foals he uses pads made by stuffing long stockings, tying the toes together and fastening in a V-shape on either side of the sheath.

Dr. S. H. Ward told in a very interesting way how *dourine* has been eradicated from Minnesota and the difficulties experienced in diagnosing this disease. "*Contagious Abortion*" was ably discussed by Dr. W. L. Boyd and brought out an interesting discussion.

Minnesota veterinarians are to be congratulated not only on the splendid papers and discussions, but upon the prompt business way the meetings are conducted.

N. S. M.

NOTE—The above (as the initials indicate) are some impressions made upon Secretary Mayo, of the A. V. M. A., by the Minnesota State Veterinary Medical Association, and the manner in which our brothers in that state conduct organization affairs.

MASSACHUSETTS VETERINARY ASSOCIATION.

The regular meeting of the above association was held at Boston December 16, 1913. About thirty-five members and guests were present. We had an honored guest, Prof. Theobald Smith, who gave a most instructive lecture on the subject of *Facts and Problems of Human and Bovine Tuberculosis*.

President Perry called the meeting to order and announced that the reading of the previous meeting's records would be deferred until Prof. Smith had delivered his lecture. Dr. Burr then introduced Prof. Smith. He elaborately illustrated his subject by numerous stereopticon views of the several types of the tubercle bacilli and pathogeny, and held the close attention of all present for over two hours. In conclusion, Dr. Howard moved, and was seconded by Dr. Abele, that a vote of thanks be extended to Prof. Smith, which was made manifest by a rising vote. President Perry then requested the secretary to read the December meeting records, and after their acceptance announced that the meeting was open for discussion of case reports. In quick response, Dr. Dodge presented a teratoma from a cow which was situated near the trachea. Dr. Playden reported a case in a cow showing *physical symptoms of tuberculosis*, and after subjecting her to the tuberculin tests three times at proper intervals, with no reaction, he cast the animal, inserted a trachea tube and removed a retropharyngeal lymph gland, which he sent to Dr. Frothingham, but at the time of this meeting he had received no report. Discussion then arose as to the subject of entertainment for the January meeting; and on a motion by Dr. Peirce, seconded by Dr. Pierce, an illustrated lecture on the subject of certified milk was unanimously accepted. Adjournment.

W. T. PUGH, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting of this association was held in Leonard Pearson Hall at the University of Pennsylvania, January 12, 1913.

The meeting was called to order at 8.30 p. m. by President Yunker. Over thirty members were in attendance, and as guests, Dr. Charles Cotton of Minneapolis and Dr. John Turner of

Washington, and as visitors, about fifty veterinarians who were attending the special course at the University at the time.

The president introduced Dr. Cotton as the first speaker for the evening, who considered that old and interesting disease, glanders, touching mainly upon its diagnosis and its eradication. Up until the present time they have been using mallein in the State of Minnesota in testing for glanders, and have been able by the use of this diagnostic agent to keep glanders well under control and are rapidly eradicating it from that state. In the year 1904 there were 554 cases of glanders; in 1910, 213, and in 1913 there were 128 cases. The discussion on this paper was opened by Dr. C. J. Marshall, followed by Drs. Reichel, Crocker, Hardenberg and Fitzpatrick, and closed by Dr. W. H. Hoskins.

The president next introduced Dr. John Turner of Washington, D. C., who addressed the association on useful information about a dairy farm. He called particular attention to the physical examination of cows, stating that while it was not an accurate means for the detection of tuberculosis, yet in making this examination you find very frequently conditions which were oftentimes just as injurious as tuberculosis. Adjournment.

CHESTON M. HOSKINS, Secretary.

NEW YORK STATE BREEDERS' ASSOCIATION.

The following resolution was adopted at the New York State Breeders' Association while in session at Rochester in February:

Whereas, The scarcity of colts bred in this state is due to scrub stallions and lack of sound, pure-bred sires; and

Whereas, It requires at least 80,000 horses, at a cost of \$20,000,000, bred outside of the state, to supply its demand; and

Whereas, Our present Stallion Law is inadequate; be it

Resolved, That it is the sense of the New York State Breeders' Association that a suitable bill be drafted to improve the stallion service in this state, and same be introduced at the present legislature that will gradually eliminate the use of the scrub and mongrel sire.

WOULD PUT A CROWN ON THE EDITORS.—A Nebraska subscriber, in renewing his subscription to the REVIEW, writes: "Keep the good work up. You shall wear a crown."

NEWS AND ITEMS.

DR. S. J. WALKLEY, SECRETARY OF THE NATIONAL ASSOCIATION OF THE B. A. I., furnished the following news items: The Annual Agriculture Appropriation Bill has been reported out of committee. I think it was on the 13th instant. Therefore arrangements are being rapidly perfected for my departure for Washington to appear before the House Committee on Agriculture.

Weekly statements regarding the progress of our association work in general and particularly relating to H. R. 9292 are being made in the columns of *Civil Service News*, which is a paper devoted exclusively to news regarding the employees in the public service and which is printed at 623 Reaper Block, 105 North Clark-street, Chicago, Ill.

Officers and members of the N. A. B. of A. I. E. in different sections of the U. S. have extended invitations to all senators and congressmen to visit packing houses, stock yards and dipping vats, in order to witness bureau employees engaged in their official duties. Many of the solons have accepted these invitations and have expressed themselves as being amazed at the great volume of work performed by the bureau inspectors and were well pleased with the accuracy of the inspectors, and in many cases they marvelled at the speed that must necessarily be acquired by the inspectors in order to detect diseases as the carcasses rush by them. In many cases the congressmen and senators confessed that they had no idea prior to their visit of the magnitude or import of the work and were shocked to learn of the meager salaries paid to the bureau men upon whom such great responsibility rests. Correspondence on file in this office shows that the bureau work is classed as hazardous by accident insurance companies, and various congressmen upon witnessing the work have stated that they regarded the work as being of a hazardous nature.

This association also has the backing of the Wisconsin Anti-Tuberculosis Association, of which Dr. Hoyt E. Dearholt, 314 Goldsmith Building, Milwaukee, Wis., is the executive secretary. Dr. Dearholt, in company with Dr. M. P. Ravenel, president of the Anti-Tuberculosis Association of Wisconsin and director of the Wisconsin State Laboratory of Hygiene, recently visited several of the meat packing plants in Wisconsin.

HOUSE COMMITTEE ON AGRICULTURE IN THE 63D CONGRESS,
2D SESSION, WHO HAVE CHARGE OF THE LOBECK BILL
—H. R. 9292.

Democratic Representatives—Asbury Francis Lever, chairman, South Carolina, 7th District, Lexington, S. C.; Gordon Lee, Georgia, 6th District, Chickamauga, Ga.; J. Thomas Heflin, Alabama, 5th District, Lafayette, Ala.; James T. McDermott, Illinois, 4th District, Chicago, Ill.; John A. Maguire, Nebraska, 1st District, Lincoln, Nebr.; Thomas L. Rubey, Missouri, 16th District, Lebanon, Laclede Co., Mo.; James Young, Texas, 3d District, Kaufman, Texas; H. M. Jacoway, Arkansas, 5th District, Dardanelle, Ark.; Ralph W. Moss, Indiana, 5th District, Center Point, Ind.; John V. Leshner, Pennsylvania, 16th District, Sunbury, Pa.; Michael Reilly, Wisconsin, 6th District, Fond du Lac, Wis.; Benjamin Taylor, New York, 25th District, Harrison, N. Y.; Dudley Doolittle, Kansas, 4th District, Strong City, Kas.; Ezekiel S. Candler, Jr., Mississippi, 1st District, Corinth, Miss.

Republican Representatives—Gilbert N. Haugen, Iowa, 4th District, Northwood, Worth Co., Ia.; James C. McLaughlin, Michigan, 9th District, Muskegon, Mich.; Willis C. Hawley, Oregon, 1st District, Salem, Ore.; Joseph Howell, Utah, at large, Logan, Cache Co., Utah; Chas. H. Sloan, Nebraska, 4th District, Geneva, Nebr.; Henry T. Helgeson, North Dakota, 1st District, Milton, N. Dak.; Chas. E. Patton, Pennsylvania, 21st District, Curwensville, Pa.

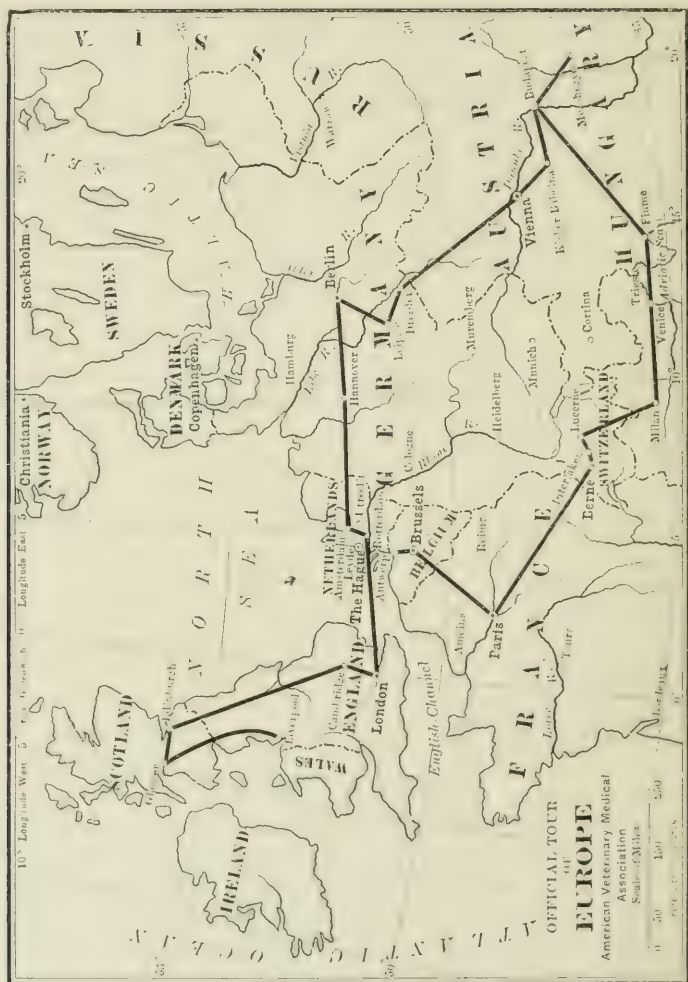
Republican Territorial Delegate—J. Kuhio Kalanianaʻole, Honolulu, Hawaii, Honolulu.

SENATE COMMITTEE ON AGRICULTURE AND FORESTRY IN THE
63D CONGRESS (2D SESSION).

Democratic Senators—Thomas P. Gore, chairman, Lawton, Okla.; George E. Chamberlain, Portland, Ore.; Ellison D. Smith, Florence, S. C.; Hoke Smith, Atlanta, Ga.; Morris Sheppard, Texarkana, Texas; John F. Shafroth, Denver, Colo.; Joseph E. Ransdell, Lake Providence, La.; William H. Thompson, Garden City, Kan.; Joe T. Robinson, Lonoke, Ark.

Republican Senators—Francis E. Warren, Cheyenne, Wyo.; Carroll S. Page, Hyde Park, Vt.; Coe I. Crawford, Huron, S. Dak.; Wm. O. Bradley, Beachmont, Ky. (Suburb Louisville); Asle J. Gronna, Lakota, N. Dak.; James H. Brady, Pocatella, Idaho; George W. Norris, McCook, Nebr.

THE ROUTE OF THE OFFICIAL TOUR OF EUROPE BY AMERICAN VETERINARIANS, under the direction of Dr. Adolph Eichhorn, of Washington, D. C., is shown by the map below. Only two months intervene between the present one and the month in which the party sails. It is scarcely necessary for us to repeat



the great *advantage* to those who are going, of early booking, to say nothing of the *necessity* of it to those having the matter in charge. The Bureau of University Travel, 31 Trinity place, Boston, Mass., are receiving bookings from quite a number of veterinarians throughout the country, which indicates that it is to be a good-sized party.

FREDERICK H. OSGOOD, M.R.C.V.S.

After our forms had been made up for the present issue we learned of the sudden death from heart trouble of Dr. F. H. Osgood, of Boston, on February 21. Dr. Osgood is known to veterinarians all over the country, having been several times elected vice-president of the United States Veterinary Medical Association, and was elected president of that organization in 1896, presiding at the Nashville meeting in 1897; and by some chance did not attend a meeting between that time and the golden anniversary in New York in 1913. He was the original mover in organizing the veterinary profession in the State of Massachusetts; having called together all the veterinary practitioners in that State in 1884 for organization, which resulted in the Massachusetts Veterinary Association. Dr. Osgood was a native of that State, having been born in Newton April 16, 1857. After finishing at Cambridge, he attended the Massachusetts Agricultural College, where he was graduated in 1878. He studied veterinary medicine in the Royal Veterinary College, Edinburgh, and on returning to his native State started in veterinary practice in Springfield. He afterwards became connected with the Harvard Veterinary School as lecturer on cattle pathology and later as professor of veterinary surgery. He was also appointed by the Governor a member of the Cattle Commission, and was an active worker in the control and attempt to stamp out bovine tuberculosis. He at one time had one of the highest class veterinary practices in this country. He was president of the Massachusetts Veterinary Association from 1884 to 1887. In 1891 he was made veterinary surgeon to the M. V. M. and was later retired with the rank of major. He was at one time associate editor of the *Veterinary Magazine*, published in Philadelphia. The doctor is survived by a widow, two sons and a daughter.


JOHN BROOKS.

John Brooks died at his home, 236 West 134th street, New York, on February 20, after but two months absence from his duties at the veterinary school where had been constantly employed—formerly by Professor Liautard and later by Dean Coates—for upward of forty years, and was known to and remembered by every graduate during those years. And what was more wonderful, was his memory of the graduates, whom he

would recognize after twenty or more years on their return to the college. John Brooks was a man of excellent habits, his home life was of the best, he was a good citizen and held in high esteem by his neighbors. His admiration for and faithfulness to Dr. Liautard was very striking; he never ceased to speak of him with the highest regard to the end. His health began to fail last spring, and while he appeared to be convalescent during the meeting of the American Veterinary Medical Association in New York in September, where he came to meet the old graduates of the veterinary school, on resuming his duties at the college building, soon found that his days of usefulness had ended, and turned over his work to his two sons, one of whom had been assisting him.

MRS. GEORGE W. DUNPHY.

At the last moment we are in receipt of the sad news of the death of Mrs. Dunphy, wife of Dr. Geo. W. Dunphy, at their residence, Quincy, Michigan, from pneumonia, after an illness of one week. Dr. Dunphy was made State Veterinarian last October, having been for some years previously, connected with the Parke, Davis Farm at Rochester, Michigan. We voice the entire profession in expressing deep and heart-felt sympathy for our bereaved brother.



DON'T BE MISLED, THE HORSE IS STILL KING—TRUE FACTS REGARDING HORSES VS. AUTO TRUCKS.

A few of the patrons of our sales have volunteered to express the following remarks relative to the efficiency of horse-drawn vehicles in comparison to the auto truck:

Newton Coal Co.—"Use 835 horses, 2 trucks. Horses very satisfactory; sorry we can't say the same of the trucks."

Kolb Baking Co.—"Work 400 horses, 6 autos. No trouble at all with the horses, and you can't make that assertion too strong; all sorts of trouble with the autos; bought more horses to-day."

Freihofer Baking Co.—"284 horses, 20 autos. Every horse working except three; most of the autos out of repair."

Gimbel Bros.—"276 horses at work, 11 automobiles. Haven't had an unsuccessful trip with the horses during the storm, nor a successful one with the autos."

United States Express Co.—“259 horses; no trucks. And, best of all, not going to have any; have profited by the experience others are having with their trucks.”

Stratzebridge & Clothier.—“198 horses, 30 trucks. Have not had a trip delayed with the horses; not an accident; trucks not dependable; lots of trouble with them; many of them had to be abandoned on the roads all night.”

N. Snellenburg & Co.—“128 horses at work; 15 trucks. All horse delivery made satisfactory. Many of the trucks had to be unloaded and towed home.”

Lit Bros.—“235 horses, 37 trucks. Horses all in excellent condition and making prompt deliveries.”

National Biscuit Co.—“93 horses, no trucks. Horses so satisfactory no danger of us substituting them.”

D. B. Martin & Co.—“112 horses, 14 trucks. The trucks absolutely worthless during the snowstorm; horses working every day.”

S. & S. Beef Co.—“28 horses; all at work. Had 3 trucks, but found them so undependable and so thoroughly misrepresented, returned them.”

Acme Tea Co.—“88 horses, 16 mules, 10 trucks. Horses and mules going at it every day. Oft times compelled to send out for the trucks.”

Samuel Bell Sons.—“80 horses, 2 trucks. No trouble at all with the horses; trucks very unsatisfactory, get stuck nearly every time they go out in the storm; horses much the better.”

Union Traction Co.—“250 horses, 4 autos. Horses giving great satisfaction during the storm; no trouble whatsoever.”

U. G. I. Co.—“89 horses, 6 autos. Horses very efficient, autos rather troublesome.”

Jno. J. Felin & Co.—“97 horses, 1 truck. Horses out every day, truck in the shop every other day; cost as much to run the truck as eight horses.”

Finley Acker Co.—“33 horses, 3 trucks. Horse service very satisfactory; one truck in the shop, one truck returned (undependable), the other truck Saturday got out as far as Jenkintown, gave out, were compelled to hire horse and sleigh and deliver goods that way.”

Peter Cavanaugh.—“80 horses, 1 truck. Horses can make delivery anywhere; truck a source of trouble and expense since the day I purchased it. Would that it would only jump overboard or burn itself up without doing any other damage; no

more trucks for me, but resolve to stick to horses, as I could always use them to great advantage."

Alsover's Express Co.—"We are working 20 horses. Have no trouble at all with them. Had six auto trucks. Done away with five of them. Lost \$13,000 in seven months experimenting with auto trucks. Horses for us in the future."

People Bros.—"Work 300 horses. No automobiles. Horses have always been satisfactory to us; the auto man has never been able to convince us differently."

James Irvin.—"200 horses; all at work during the storm. No auto trucks, and, what is more, won't have any; saw too many good fellows go broke trying to keep them up. You would want to be a millionaire to pay repair bills on them."

S. D. Hall.—"200 horses at work every day. No trouble whatsoever, wouldn't have an auto truck in my place."

Atlantic Refining Co.—"250 horses working, 10 auto trucks. Trucks not doing any good, cost so much more to operate than horses; absolutely worthless in the storm."

Adams Express Co.—"The auto delivery is much more expensive than the horse-drawn vehicles; found it necessary to equip all our autos with shovels in order to dig machines out of snow when occasion required."

Showell & Fryer.—"We are working 65 horses, 4 auto trucks. Horses doing well, auto trucks all out of commission. Wished that we had never owned one."

Knickerbocker Lime Co.—"70 horses. Have given good satisfaction through the snowstorm; all at work; none standing in. Our automobile in shop laying there for repairs.

"W. B. IRVINE."

Frank Curran.—"Working 300 horses in a municipal contract; no auto trucks."

Jas. D. Dorney.—"Working 325 horses. No auto trucks."

A Customer living at Bryn Mawr, in driving from Philadelphia to Bryn Mawr on Wednesday, discovered 19 auto delivery wagons abandoned along the Montgomery Pike; they bore the name of different Philadelphia merchants. No such conditions as this exists among the horsedrawn vehicles.

Moral.—If these keen business men find the horse the most efficient mode of delivery, why not you?

MORGAN & SULLIVAN, Auctioneers.

Phila. Record., (Feb. 22, 1914).

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n.....	Mar. 5-6-7 1914.....	Auburn.....	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.....	April, 1914.....	141 W. 54th St., New Orleans, La.	P. K. Nichols, Port Richmond, N.Y. Nelsen S. Mayo, 4753 Ravenswood Ave., Chicago, Ill.
American V. M. Ass'n.....	Dec., 28-31, 1914.....	Ft. Smith.....	J. B. Arthur, Russellville.
Arkansas Veterinary Ass'n.....	January, 1914.....	Lec. Room, La- val Un'y, Mon.	J. P. A. Houde, Montreal.
Ass'n Médéciale Veterinaire Française. "Laval".....	1st and 3d Thur. of each month.....	Chicago.....	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., Chicago.....	2d Fri. each month.....	S. Omaha, Neb.	E. J. Jackson, So. Omaha.
B. A. I. Vet. In. A., So. Omaha.....	3d Mon. each month.....	St. Joseph and vicinity.....	F. W. Caldwell, St. Joseph, Mo
Buchanan Co. Vet. Ass'n.....	Monthly.....	San Francisco.....	John F. McKenna, Fresno.
California State V. M. Ass'n.....	December 10, 1913.....	Ottawa.....	A. E. James, Ottawa.
Central Canada V. Ass'n.....	Feb. and July.....	Syracuse.....	W. B. Switzer, Oswego.
Central N. Y. Vet. Med. Ass'n.....	June and Nov.....	Chicago.....	D. M. Campbell, Chicago.
Chicago Veterinary Society.....	2d Tues. each month.....	Ft. Collins.....	I. E. Newsum, Ft. Collins.
Colorado State V. M. Ass'n.....	May 28-29, 1913.....	Waterbury.....	B. K. Dow, Williamantic.
Connecticut V. M. Ass'n.....	Aug. 4, 1914.....	Wilmington.....	A. S. Houchin, Newark, Del.
Delaware State Vet. Society.....	Jan., Apl., July, Oct.....	Newark, N. J.....	J. F. Carey, East Orange, N. J.
Essex Co. (N. J.) V. M. A.....	3d Mon. each month.....	Rochester.....	J. H. Taylor, Henrietta.
Genesee Valley V. M. Ass'n.....	2d week, July, 1913.....	Atlanta.....	P. F. Bahnsen, Americus.
Georgia State V. M. A.....	Dec. 22-23, 1913.....	Wash., D. C.....	I. M. Cashel.
V. M. A. of Geo. Wash. Un'y.....	1st Sat. each month.....	Belleville, Ill.....	Louis P. Cook, Cincinnati.
Hamilton Co. (Ohio) V. A.....	Mar. 26, 1914.....	Chicago.....	L. B. Michael, Collinsville, Ill.
Illmo Vet. Med. Ass'n.....	December, 1913.....	Indianapolis.....	L. A. Merrillat, Chicago.
Illinois State V. M. Ass'n.....	Jan. 14, 1914.....	Pending.....	A. F. Nelson, Indianapolis.
Indiana Veterinary Association.....	Pending.....	Manhattan.....	C. H. Stange, Ames.
Iowa Veterinary Ass'n.....	Jan. 6-7-8, 1914.....	Lexington.....	J. H. Burt, Manhattan.
Kansas State V. M. Ass'n.....	Oct. & Feb. each year.....	Philadelphia.....	Robert Graham, Lexington.
Kentucky V. M. Ass'n.....	2d Tues. each month.....	Pending.....	Cheston M. Hoskins.
Keystone V. M. Ass'n.....	Pending.....	Lake Charles.....	Phil. H. Fulstow, Norwalk, Ohio.
Lake Erie V. M. Association.....	Sept., 1914.....	Bangor.....	Hamlet Moore, New Orleans, La
Louisiana State V. M. Ass'n.....	April 8, 1914.....	Baltimore.....	H. B. Wescott, Portland.
Maine Vet. Med. Ass'n.....	4th Wed. each month.....	Young's, Boston.....	H. H. Counselman, Sec'y.
Maryland State Vet. Society.....	Feb. 3, 4, 1914.....	Lansing.....	J. H. Seale, Salem.
Massachusetts Vet. Ass'n.....	Jan. 14-15-16, 1914.....	St. Paul.....	W. A. Ewalt, Mt. Clemens.
Michigan State V. M. Ass'n.....	Aug. 29, 1913.....	Starkville.....	G. Ed. Leech, Winona.
Minnesota State V. M. Ass'n.....	Jan. 27, 28, 29, 1914.....	Kansas City, Mo.....	Wm. P. Ferguson, Grenada.
Mississippi State V. M. Ass'n.....	July, 1913.....	Kirksville.....	Hal. C. Simpson, Denison, Ia.
Missouri Valley V. Ass'n.....	Sept. 24, 25, 1913.....	Helena.....	S. Stewart, Kansas City.
Missouri Vet. Med. Ass'n.....	1st Mo. & Tu., Dec. '13.....	Lincoln, Neb.....	A. D. Knowles, Livingston.
Montana State V. M. A.....	Sept., 1914.....	Rochester.....	Carl J. Norden, Nebraska City.
Nebraska V. M. Ass'n.....	June, 1914.....	Wilson.....	H. J. Milks, Ithaca, N. Y.
New York S. V. M. Soc'y.....	Week of July 20, 1914.....	Fargo.....	J. P. Spoon, Burlington.
North Carolina V. M. Ass'n.....	Nov. 1913.....	Delphos.....	A. F. Schalk, Agricultural College.
North Dakota V. M. Ass'n.....	Jan. 14, 15, 1914.....	Columbus.....	E. V. Hover, Delphos.
Nov.-Western Ohio V. M. A.....	Annually.....	Upper Sandusky.....	Reuben Hilty, Toledo.
Ohio State V. M. Ass'n.....	Fall, 1913.....	Oklahoma City.....	F. F. Sheets, Van Wert, Ohio.
Ohio Soc. of Comparative Med.....	1st Week in Feb. 1914.....	Toronto.....	J. C. Howard, Sullivan.
Okla Valley Vet. Med. Ass'n.....	Mar. 3, 4, 1914.....	Philadelphia.....	C. E. Stee, Oklahoma City.
Oklahoma V. M. Ass'n.....	Call of President.....	Manila.....	L. A. Willson, Toronto.
Ontario Vet. Ass'n.....	4th Tues. each month.....	Portland, Ore.....	John Reichel, Glenolden.
Pennsylvania State V. M. A.....	Jan. and June.....	Mon. and Que.....	David C. Kretzer, Manila.
Philippine V. M. A.....	Pending.....	Providence.....	Sam. B. Foster, Portland, Ore.
Portland Vet. Med. Ass'n.....	Aug. 5-6-7 1913.....	Pending.....	Gustave Boyer, Rigaud, P. Q.
Province of Quebec V. M. A.....	1st Wed. fol. the 2d Sun. each month.....	Fillmore.....	J. S. Pollard, Providence.
Rhode Island V. M. Ass'n.....	June 17, 1914.....	St. Louis.....	B. K. McInnes, Charleston.
Rhode Island V. M. Ass'n.....	Pending.....	Reading.....	F. Hockman, Iola.
South Carolina Ass'n of Veter'ns.....	Jan., Apl., July, Oct.....	Philadelphia.....	Wm. T. Conway, St. Louis, Mo.
South Illinois V. M. and Surg. Ass'n.....	4th Tues. each month.....	Madison.....	W. G. Huyett, Wernersville.
South St. Joseph Ass'n of Vet. Insp.....	November, 1914.....	Los Angeles.....	B. T. Woodward, Wash'n, D. C.
Tennessee Vet. Med. Ass'n.....	Nov., 1913.....	407 Illinois Ave.....	S. W. Allen, Watertown.
Texas V. M. Ass'n.....	2d Thu. each month.....	Nashville.....	J. A. Dell, Los Angeles.
Twin City V. M. Ass'n.....	Spring of 1914.....	College Station.....	H. R. Collins, South St. Joseph.
Utah Vet. Med. Ass'n.....	514 9th St., N.W. Wash'ton, D. C.....	St. P.-Minneap.....	O. L. McMahon, Columbia.
Vermont Vet. Med. Ass'n.....	Winnipeg.....	Salt Lake City.....	Allen J. Foster, Marshall.
Veterinary Ass'n of Alberta.....	Trenton.....	St. Louis.....	M. H. Reynolds, St. Paul, Minn.
Vet. Ass'n Dist. of Columbia.....	1st Sat. each month.....	St. Louis.....	E. J. Coburn, Brigham City.
Vet. Ass'n, Geo. Wash. Univ.....	Feb. & July each yr.....	St. Louis.....	G. T. Stevenson, Burlington.
Vet. Ass'n of Manitoba.....	January 8, 1914.....	St. Louis.....	C. H. H. Sweetapple, For. Saskat- chewan, Alta., Can.
Vet. Med. Ass'n of N. J.....	1st Wed. each month.....	St. Louis.....	M. Page Smith, Washington, D. C
V. M. Ass'n, New York City.....	Monthly.....	St. Louis.....	J. M. Cashel, 2115 14th Street.
Veterinary Practitioners' Club.....	July 9-10 1914.....	St. Louis.....	Wm. Hilton, Winnipeg.
Virginia State V. M. Ass'n.....	1st & 3d Fri. Eve.....	St. Louis.....	E. L. Loblein, New Brunswick.
Washington State Col. V. M. A.....	June 1914.....	St. Louis.....	R. S. MacKellar, N. Y. City.
Washington State V. M. A.....	3d Thu. each month.....	St. Louis.....	T. F. O'Dea Union Hill, N. J.
Western Penn. V. M. Ass'n.....	Feb. 10, 11, 1914.....	St. Louis.....	Geo. C. Faville, North Emporia.
Wisconsin Soc. Vet. Grad.....	June, Sept., Dec., Mar.....	St. Louis.....	R. J. Donohue, Pullman.
York Co. (Pa.) V. M. A.....	514 9th St., N.W. Wash'ton, D. C.....	St. Louis.....	Carl Cozier, Bellingham.
		St. Louis.....	Benjamin Gunner, Sewickley.
		St. Louis.....	W. W. Arzberger, Watertown
		St. Louis.....	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.60; students while attending college, \$2; Students in Canada, \$2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. Make all checks or P. O. orders payable to American Veterinary Review.

TERP HEROIN AND DROSERA FOSTER'S is just what you need at this season for both your horse and dog patients with coughs, bronchitis, laryngitis, etc. Do not wait until the last minute, stock up and be the man who is prepared to take care of those troublesome conditions promptly. Write them to-day and mention the REVIEW. See adv. on page 11 of this issue.

WHEN YOU NEED A DISINFECTANT you do not need a bad, disagreeable smell. How would you like a disinfectant the potency and reliability of which is A 1 and the smell of which is not only not disagreeable but positively pleasant. And when you put it in the water it produces a softness to it that is positively beneficial both to your hands and your instruments. Your hands continue to get softer and smoother when you use it regularly. And once you use it, you *will* use it regularly. We refer to *Therapogen*, and what we say is not hearsay, but from experience dating back a number of years. Write Mr. THEODORE MEYER about it, whose address you will find on page 27 of this issue. Things are always pleasanter when properly introduced to a person, so use the REVIEW as an introduction when you write.

MOLLICODDLES is the name of a new dog biscuit, composed of *meat, wheat* and *milk*; the last-named ingredient being new, an addition to those already contained in the Spratts Dog Cakes and Puppy Cakes. This addition—milk—adds to the palatableness of the biscuit, and is therefore a great advantage in the case of convalescents, and for naturally dainty feeders. Spratts are said to have a biscuit for every breed, and are earning the reputation of providing a biscuit for every appetite. These biscuits are not yet actually on the market; but you can get them by writing direct to the Spratts people, and specifying *Mollicoddles* as spoken of in the March number of the AMERICAN VETERINARY REVIEW. We had some of the first bake and our cats ate them up—most of them at least—while we tried them on dogs of different breeds and temperaments. They all liked them. You will find Spratts' address on page 17 of this issue.

RECEIVED LNT DEC 15 1934

SF American Veterinary
601 Medical Association
A5 Journal
v.44
cop.2
Biological
& Medical
Serials

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY

STORAGE

